



# Working Instruction, Mechanical

Applicable for S500, W580

## CONTENTS

<b>1</b>	<b>Introduction .....</b>	<b>3</b>
1.1	View of S500 and W580.....	3
1.2	Tools and Equipment.....	4
1.3	General Cautions.....	5
1.4	Adhesives .....	5
1.5	Using Hand and ESD Protection.....	5
1.6	Protection of Displays, Lenses, and Windows.....	5
1.7	Acceptable Pry Tools .....	5
<b>2</b>	<b>Disassembly .....</b>	<b>6</b>
2.1	Overview .....	6
2.1.1	Battery Cover Removal .....	7
2.1.2	Battery Removal.....	7
2.1.3	Label Removal .....	8
2.1.4	Front Cover Removal .....	9
2.1.5	Camera Cover Removal.....	11
2.1.6	Front Cover Screw Removal (6 screws).....	12
2.1.7	Front Frame Removal .....	13
2.1.8	Upper Rear Cover Removal .....	17
2.1.9	Rear Frame Screw Removal (4 screws).....	18
2.1.10	Chin Cover Removal .....	19
2.1.11	Hinge Assembly Removal from Rear Frame .....	20
2.1.12	PC Board/Antenna assembly Removal from Rear Frame ...	21
2.1.13	Antenna/Cable Assembly Removal from PC Board .....	23
<b>3</b>	<b>Part Replacement.....</b>	<b>24</b>
3.1	Bluetooth Antenna .....	24
3.2	Bonzer Flex .....	25
3.3	Camera .....	29
3.4	Camera Cover .....	29
3.5	Chin Cover .....	29
3.6	Coaxial Cable and Antenna .....	30
3.7	Front Cover .....	30
3.8	Front Frame .....	31
3.9	Hinge Assembly .....	32
3.10	Hinge Tape .....	33
3.11	Keypad .....	35
3.12	LCD Assembly .....	36



3.13 LCD Bezel.....	40
3.14 LCD Gasket.....	42
3.15 Liquid Intrusion Indicator.....	43
3.16 Main Keypad Flex.....	43
3.17 Memory Stick Cover.....	47
3.18 Microphone.....	49
3.19 Microphone Gasket.....	50
3.20 Navigation Keypad.....	50
3.21 Power Key.....	51
3.22 Rear Frame / Pad.....	51
3.23 Receiver and Gasket.....	52
3.24 System Connector.....	53
3.25 Upper Rear Cover.....	53
3.26 Vibrator.....	54
3.27 Volume Key.....	55
3.28 Wear Strips.....	56
3.29 Board Swap – Replace Swap Board.....	57
3.30 Board Swap – Change Label.....	57
3.31 Board Swap – Customize Software.....	57
<b>4 Reassembly.....</b>	<b>58</b>
<b>4.1 Overview.....</b>	<b>58</b>
4.1.1 Antenna/Cable Assembly Installation to PC Board.....	59
4.1.2 PC Board and Antenna Installation.....	60
4.1.3 Hinge Assembly Installation to Rear Frame.....	62
4.1.4 Rear Frame Screw Installation (4 Screws).....	63
4.1.5 Upper Rear Cover Installation.....	64
4.1.6 Chin Cover Installation.....	66
4.1.7 Front Frame Installation.....	67
4.1.8 Front Frame Screw Installation (6 Screws).....	71
4.1.9 Camera Cover Installation.....	71
4.1.10 Front Cover Installation.....	73
4.1.11 Label Installation.....	79
4.1.12 Battery Installation.....	80
4.1.13 Battery Cover Installation.....	80
<b>5 Country of Origin Barcodes for Brazil/VIVO Labels.....</b>	<b>81</b>
<b>6 Revision History.....</b>	<b>81</b>



# 1 Introduction

## 1.1 View of S500 and W580

**S500**



**W580**

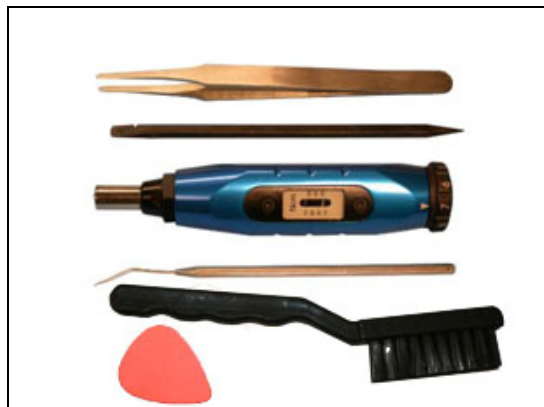


## 1.2 Tools and Equipment

The following tools and equipment should be available while performing the procedures.

### STANDARD TOOLS

- Style 2A Tweezers – Rounded Tip
- Nylon Pointer
- Torque Driver
- Dental Hook
- Plectrum
- ESD Brush



### PRODUCT SPECIFIC TOOLS

- Coaxial Cable Removal Tool
- JCIS No. 0 Screw Bit



### ESD EQUIPMENT

Protect the phone from ESD damages whenever it has been opened by using:

- ESD-wristband
- ESD-gloves



### LABEL EQUIPMENT

The following special equipment is required when replacing or installing a new label:

- Hot air device
- Zebra printer connected to computer





## 1.3 General Cautions

The following cautions are considered to be generic for all products and will not be repeated in the Disassembly, Reassembly, and Replacements sections:

- ***SWITCH OFF THE PHONE AND REMOVE ANY MEMORY STICK BEFORE THE START OF THE DISASSEMBLY!***
- ***KEEP ALL CONTACT SURFACES CLEAN!***
- ***BE CAREFUL WHEN USING TOOLS LIKE THE DENTIST HOOK, TWEEZERS, PRY TOOLS, ETC. TO AVOID SCRATCHES OR DAMAGE TO THE EXTERIOR AND INTERIOR PARTS OF THE PHONE!***
- ***BE CAREFUL NOT TO DAMAGE ANY CONTACT SPRINGS!***
- ***REMEMBER TO REMOVE THE PROTECTION FILMS ON NEW PARTS SUCH AS THE FRONT COVER AND LCD!***
- ***NEVER TOUCH THE DISPLAY GLASS!***

## 1.4 Adhesives

Use a dentist hook, the tweezers, and/or a nylon pointer to remove old adhesives. Clean the surface with isopropyl alcohol before attaching new adhesives.

## 1.5 Using Hand and ESD Protection

When handling this product, keep all surfaces clean of dirt, dust, debris, and hand oil. Use appropriate ESD precautions when working on this product. The use of finger cots or gloves, an ESD mat, and an ESD wrist strap are required at minimum.

## 1.6 Protection of Displays, Lenses, and Windows

Any time the screen portion of a display assembly, the windows of a display cover, or a camera lens is unprotected and exposed, add a protective film over the exposed part to reduce the amount of dust, finger prints, debris, and/or damage that the part may obtain.

## 1.7 Acceptable Pry Tools

Whenever the phrase “pry tool” is used, a nylon pointer or a front opening tool may be used depending on the user’s preference.

## 2 Disassembly

### 2.1 Overview

Perform the disassembly in the following order:

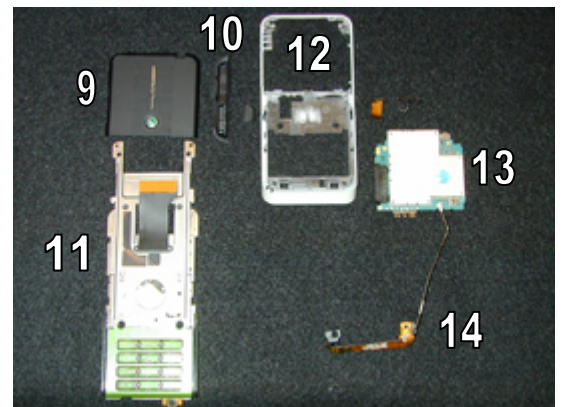
#### Upper Half of Phone

- Remove Battery Cover (1)
- Remove Battery (2)
- Remove Label (3)
- Remove Front Cover (4)
- Remove Camera Cover (6)
- Remove 6 Front Cover Screws (not shown)
- Separate Front Frame (7) and Rear Frame / Hinge Assembly (8)



#### Lower Half of Phone

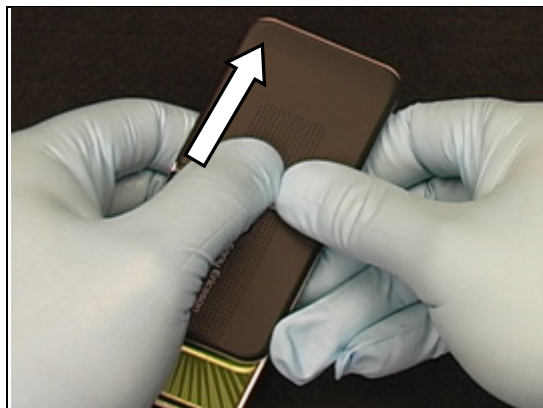
- Remove Upper Rear Cover (9)
- Remove 4 Rear Frame Screws (not shown)
- Remove Chin Cover (10)
- Remove Hinge Assembly (11) from Rear Frame (12)
- Remove PC Board/Antenna Assembly (13 & 14) from Rear Frame (12)
- Remove Antenna/cable Assembly (14) from PC Board (13)



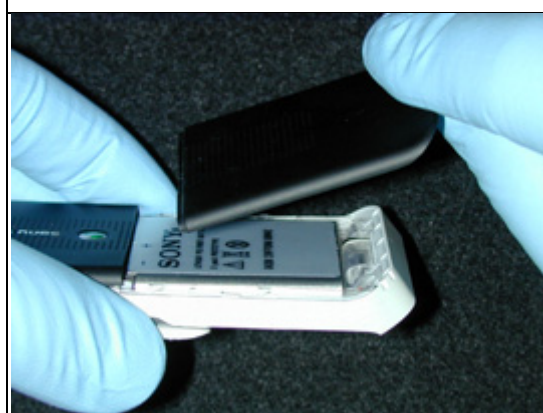


### 2.1.1 Battery Cover Removal

Use thumbs to push the battery cover down until it stops.



Lift the end of the battery cover to remove it.



### 2.1.2 Battery Removal

Use a finger to lift the battery up.



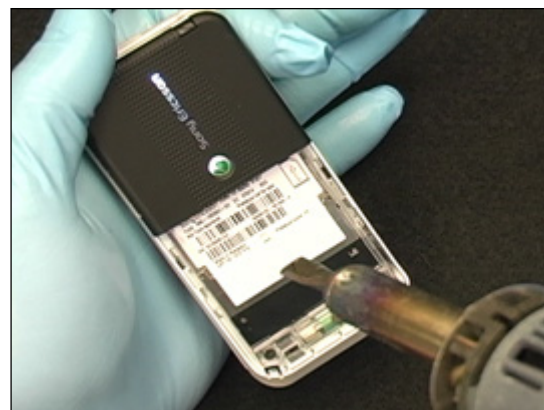
Pull the battery out of the battery cavity.



### 2.1.3 Label Removal

Apply hot air to soften the adhesive.

**NOTE: THE USE OF HOT AIR IS OPTIONAL.**

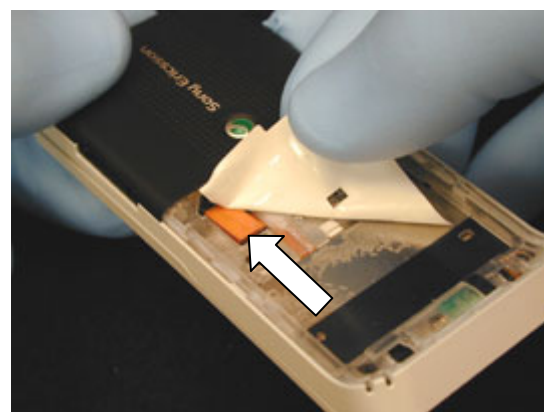


Use rounded tip tweezers to start the peeling up of the label.



Once the peeling of the label is started, use your fingers to remove the label.

**NOTE: BE CAREFUL WHEN PULLING THE LABEL OFF THE FLEX CONNECTOR.**





## 2.1.4 Front Cover Removal

Insert the plectrum in the front cover/ frame seam directly beside the upper right navigation key.

Slide the plectrum toward the top corner to release the right side latch.



Slide the plectrum around the top corner to release the upper right corner latch.



Continue around the top left corner to release the upper left corner latch.



Once the top of the volume key is reached remove the plectrum from the seam.



Insert the plectrum in the front cover/ frame seam directly beside the upper left navigation key.

Slide the plectrum toward the bottom of the volume key to release the left side latch.



Slide the phone in the open position.

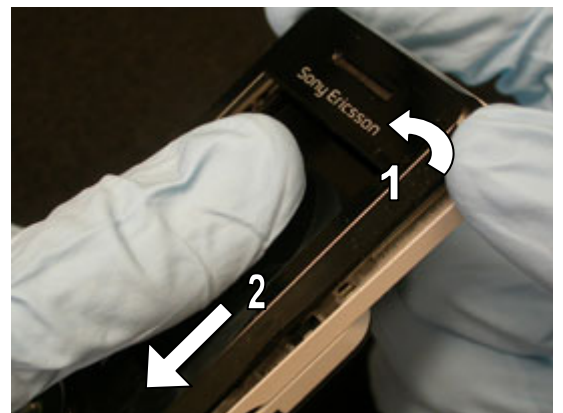


**NOTE: THE LCD MAY BE ADHERED TO THE FRONT COVER. THEREFORE THE LCD SHOULD BE HELD IN PLACE WITH YOUR THUMB WHEN REMOVING THE FRONT COVER TO PREVENT DAMAGING THE LCD.**

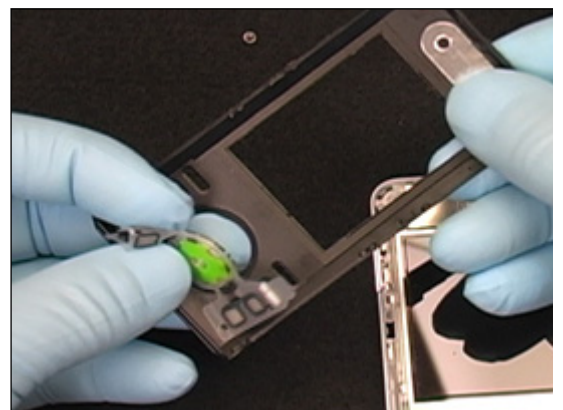
Hold LCD in place with your thumb and lift the upper end of the front cover away from the phone just enough that the side latches are clear of the frame.

Then slide the cover down towards the keypad and off of the frame.

**NOTE: DO NOT ROTATE THE FRONT COVER TOO FAR OR THE BOTTOM PEGS WILL BE DAMAGED.**

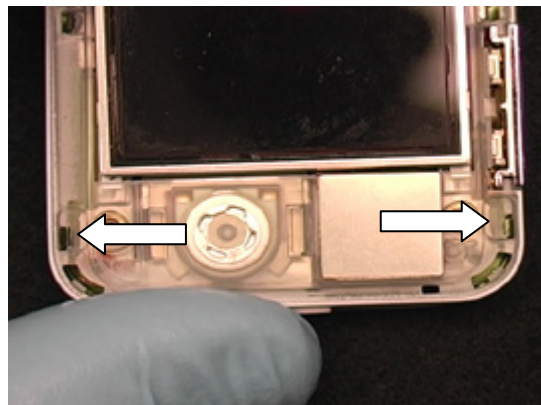


Separate the navigation keypad from the front cover.

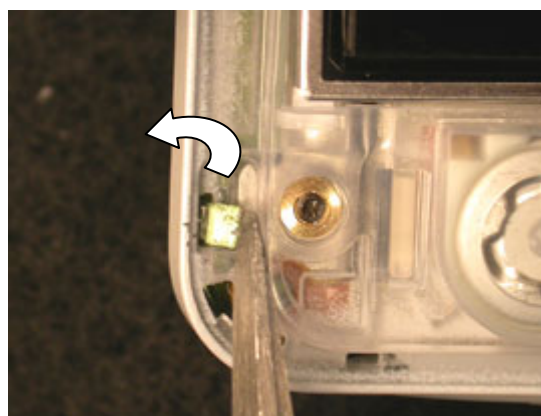


## 2.1.5 Camera Cover Removal

Locate the two tabs that hold the camera cover in place.



Use a rounded tipped tweezers to bend the metal tabs up.



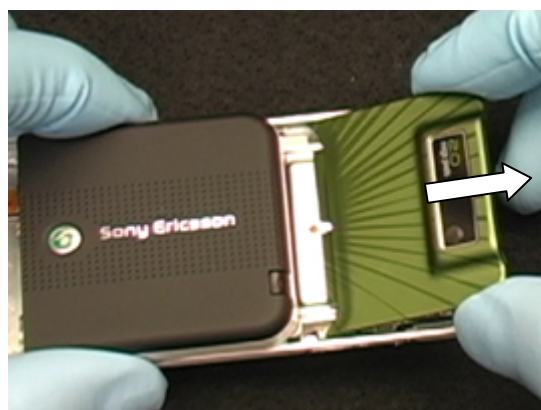
Insert a plectrum between the camera cover and the frame in the location shown to pry the cover up.



Pull the lifted end of the camera cover as shown to remove the camera cover.

**NOTE: DO NOT REUSE THE CAMERA COVER**

**NOTE: ONCE THE CAMERA COVER IS REMOVED THERE IS AN INCREASED RISK OF DAMAGING THE SLIDING TEFLON TAPE ON THE HINGE. OPEN AND CLOSE THE HINGE ONLY WHEN NECESSARY. KEEP BOTH HALVES OF THE HINGE AS PARALLEL AS POSSIBLE WHEN OPENING AND CLOSEING.**



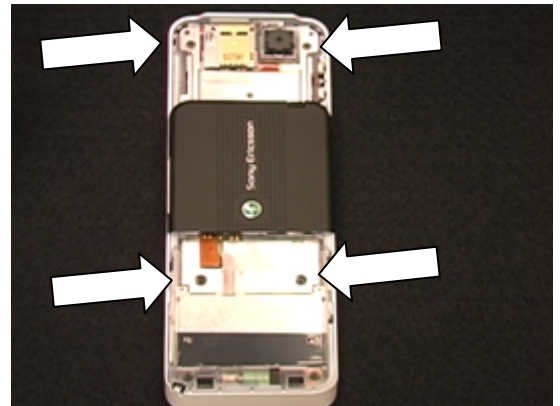




## 2.1.6 Front Cover Screw Removal (6 screws)

Slide the hinge into the open position, and then use a torque wrench and a JCIS-0 bit to remove the 4 visible screws.

**NOTE: DO NOT REUSE THE SCREWS.**

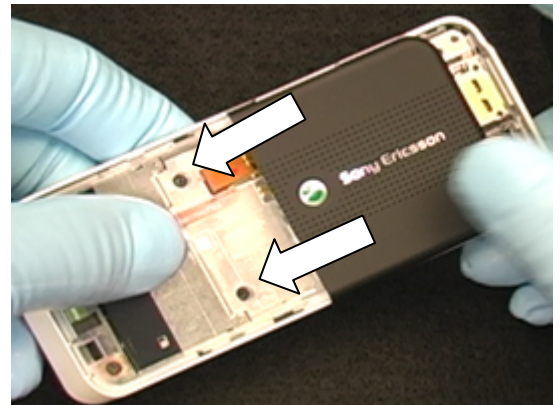


Use the magnetism of the wrench to pull the bottom screws up through the hole in the hinge.



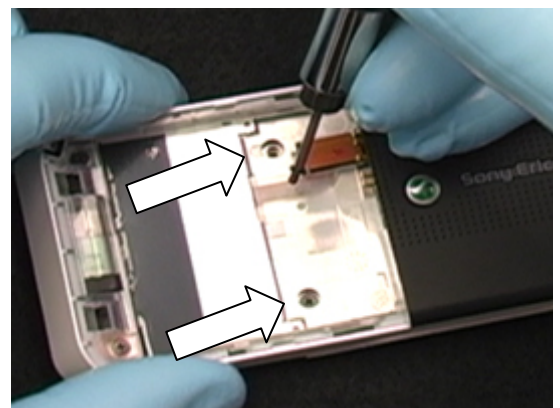
Slide the hinge partially closed until the remaining 2 screws are visible.

**NOTE: OPEN AND CLOSE THE HINGE ONLY WHEN NECESSARY. KEEP BOTH HALVES OF THE HINGE AS PARALLEL AS POSSIBLE WHEN OPENING AND CLOSING.**



While holding the hinge in the partially closed position, remove the screws.

**NOTE: DO NOT REUSE THE SCREWS.**



## 2.1.7 Front Frame Removal

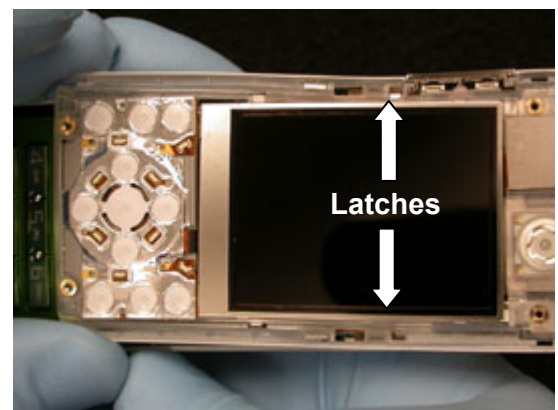
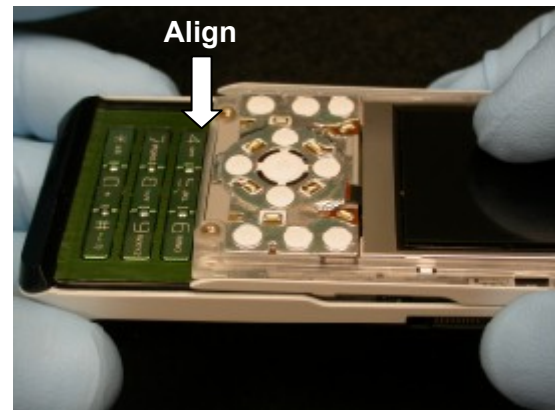
Slide the phone so that the bottom edge of the phone's upper half is aligned with the top edge of the 4, 5, & 6 row of keys.

**NOTE: THE TWO HALVES OF THE PHONE WILL HAVE TO BE HELD IN PLACE TO MAINTAIN THIS ALIGNMENT.**

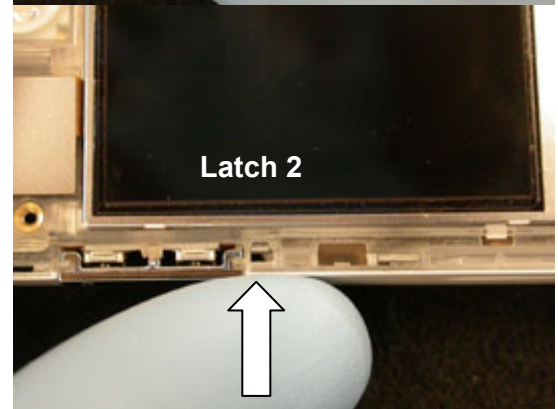
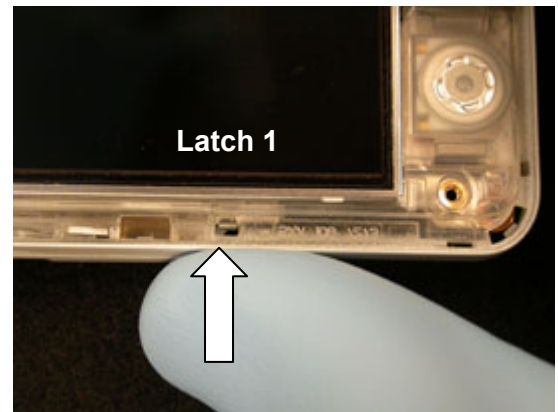
Lift the bottom edge of the phone's upper half approximately 10-15 mm.

**NOTE: DO NOT SLIDE THE HINGE WHILE THE BOTTOM END IS LIFTED. THIS COULD DAMAGE THE TEFLON SLIDING TAPE**

With the bottom edge the phone's upper half lifted, locate the two side latches holding the front frame on the hinge.



One at a time, press inward on the side of the front frame at each of the latch locations to release the latches.

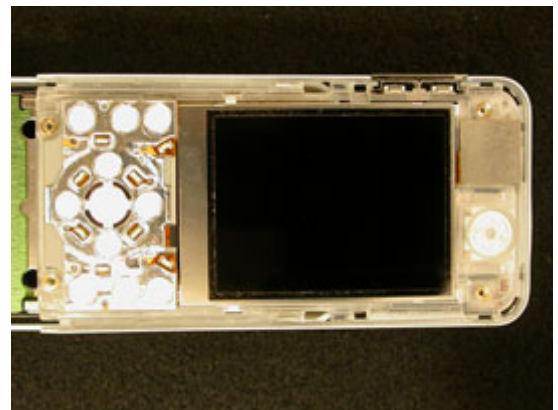


The front frame is now unlatched from the hinge.

**NOTE: THE LCD ASSEMBLY MUST BE DETTACHED BEFORE DISCONNECTING THE FLEX CONNECTION BETWEEN THE FRONT HALF OF THE PHONE AND THE HINGE ASSEMBLY TO REDUCE THE RISK OF FLEX FILM DAMAGE.**

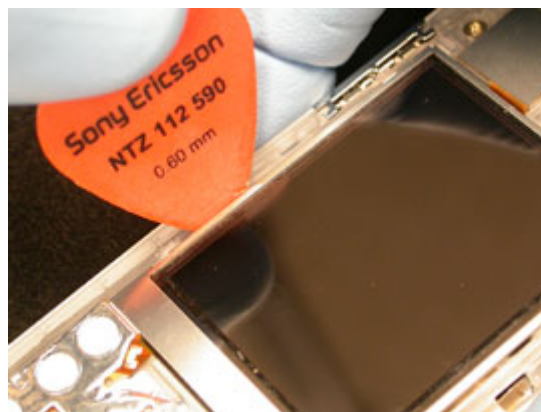


Lay the front of the phone loosely on top of the hinge





Insert the tip of the plectrum between the left side of the LCD assembly and the front frame.



Rotate the plectrum away for the LCD to release the lower left side retention feature.



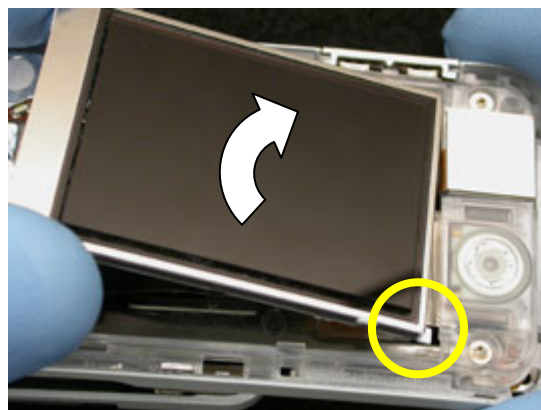
Insert the tip of the plectrum between the right side of the LCD and the front frame.



Rotate the plectrum away for the LCD to release the lower right side retention feature.

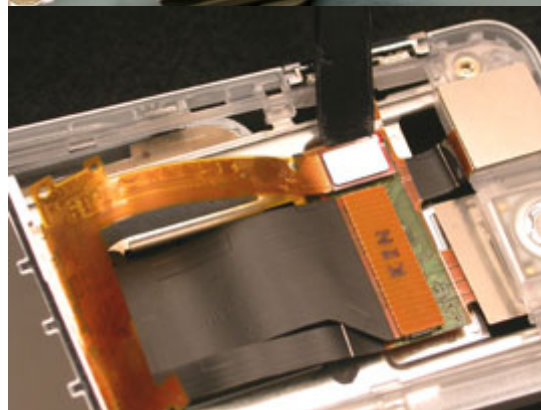


Free the upper two LCD retention features by wiggling to LCD to the left and right.



Once free, lift the LCD assembly out of the way and detach its flex connection using a pry tool.

Set the detached LCD assembly aside.



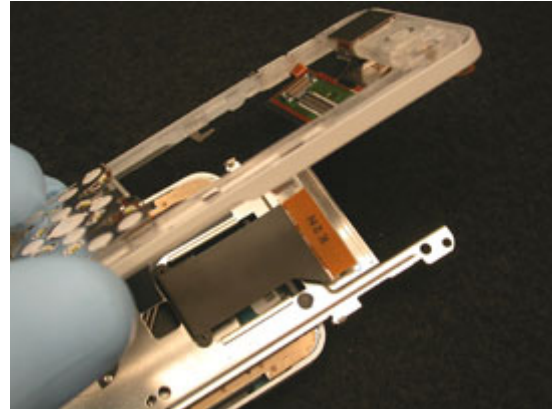
Using a pry tool, carefully disconnect the hinge flex from the bonzer flex.

**NOTE: IN SOME CASES THERE ARE ADHESIVE STRIPS THAT HOLD THIS CONNECTION TOGETHER. BE CAREFUL NOT THE DAMAGE THE BONZER FLEX OF THE HINGE FLEX WHEN TRYING THE SEPARATE THE CONNECTION.**



Once the hinge flex is disconnected, remove the front frame.

**NOTE: OPEN AND CLOSE THE HINGE ONLY WHEN NECESSARY. KEEP BOTH HALVES OF THE HINGE AS PARALLEL AS POSSIBLE WHEN OPENING AND CLOSING.**



## 2.1.8 Upper Rear Cover Removal

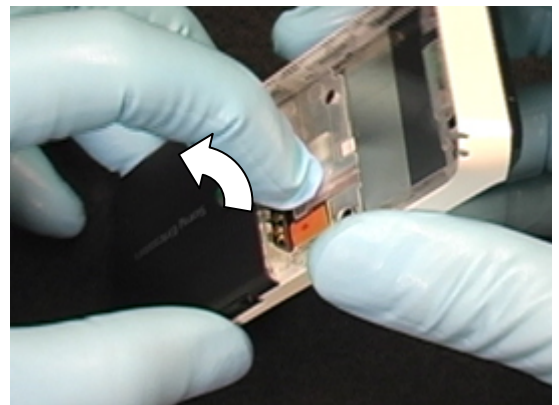
Insert a pry tool between the rear cover and the rear frame at the location shown.



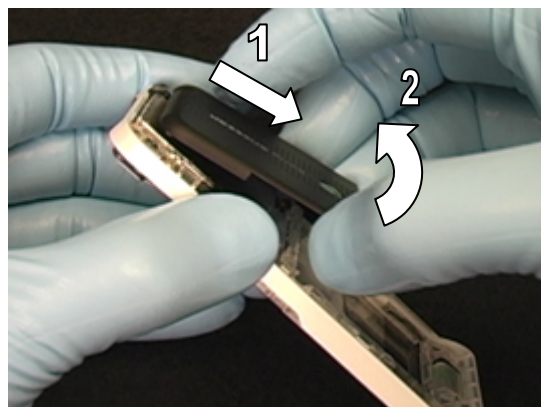
Push the pry tool into the seam and toward the left side of the cover so that latch holding the left corner of the cover releases.



Lift up on the rear cover to release the middle and right side latches.



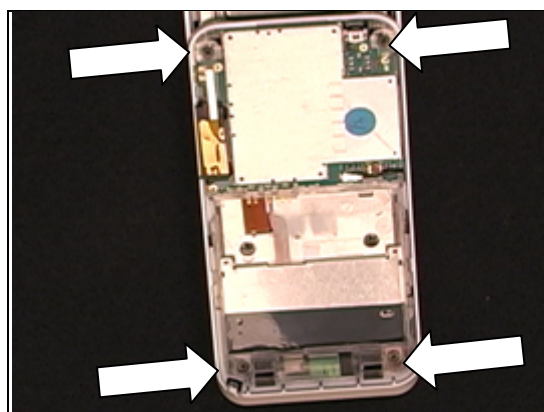
Pull the rear cover down and rotate the lifted end of the cover away from the rear frame.



### 2.1.9 Rear Frame Screw Removal (4 screws)

Use a torque wrench and a JCIS-0 bit to remove the 4 screws.

**NOTE: DO NOT REUSE THE SCREWS.**



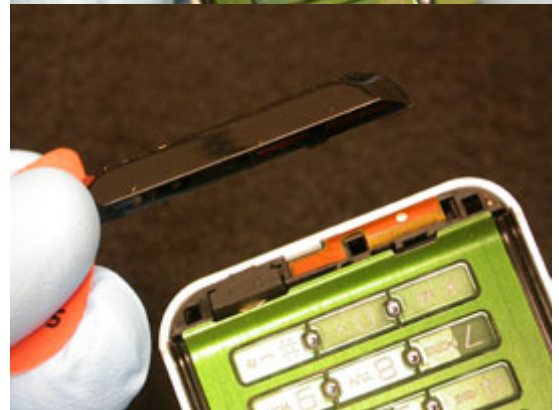
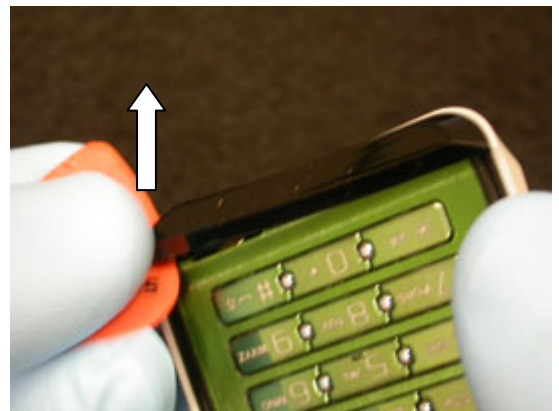


## 2.1.10 Chin Cover Removal

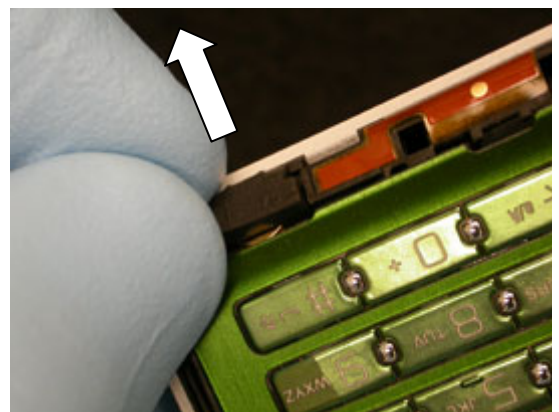
Insert the plectrum between the keypad and the left end of the chin cover.



Using the plectrum, lift up of the left end of the chin cover to get the chin cover to unsnap from the rear frame.



Remove the microphone gasket using your fingers.

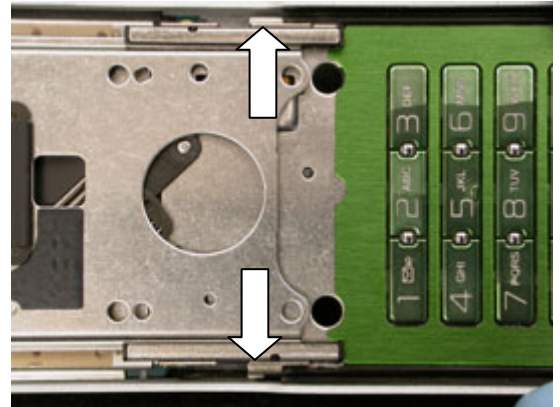




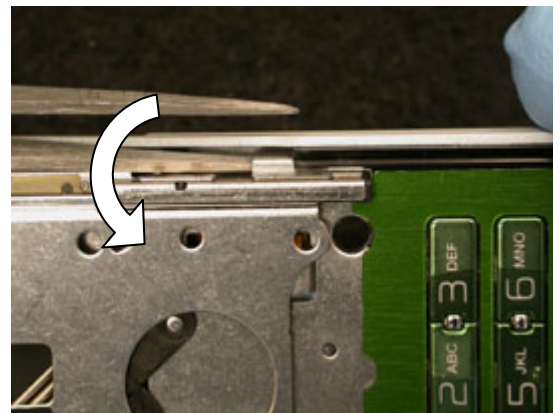
## 2.1.11 Hinge Assembly Removal from Rear Frame

**NOTE: OPEN AND CLOSE THE HINGE ONLY WHEN NECESSARY. KEEP BOTH HALVES OF THE HINGE AS PARALLEL AS POSSIBLE WHEN OPENING AND CLOSING.**

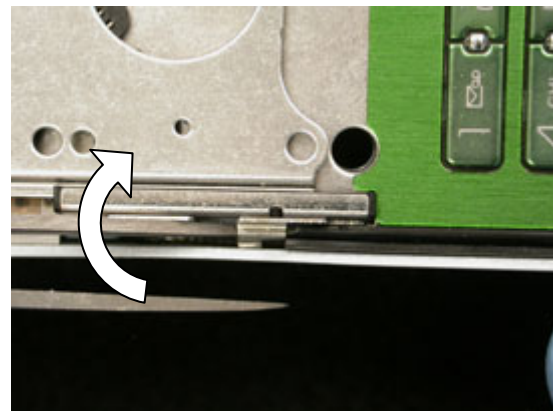
With the hinge open and the keypad up, locate the metal clips holding the hinge assembly on the rear frame.



Insert tweezers or a small screwdriver under one of the metal clips and twist toward the center of the phone to release the latch.

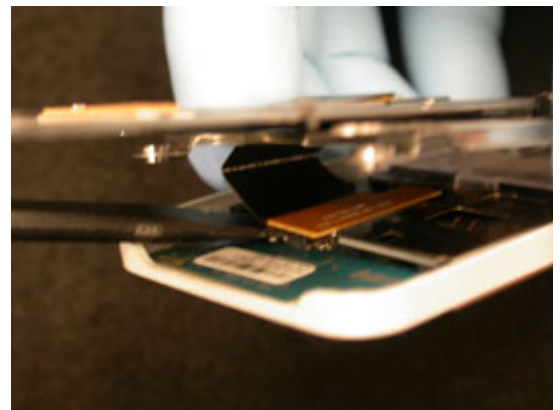


Insert tweezers or a small screwdriver under the other metal clip and twist toward the center of the phone to release the latch.



Lift the “non-keypad” end of the hinge assembly away from the rear frame.

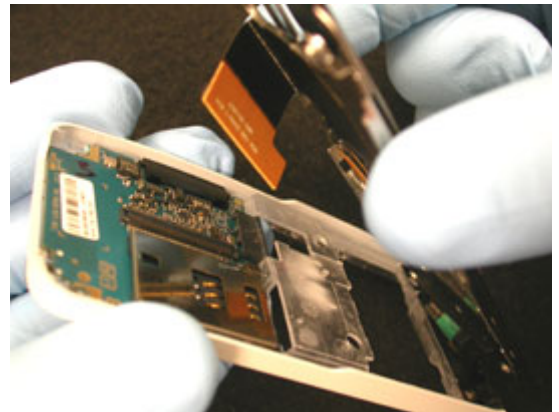
Use a pry tool to unplug the hinge-to-board connector.







Lift the hinge assembly from the rear frame.

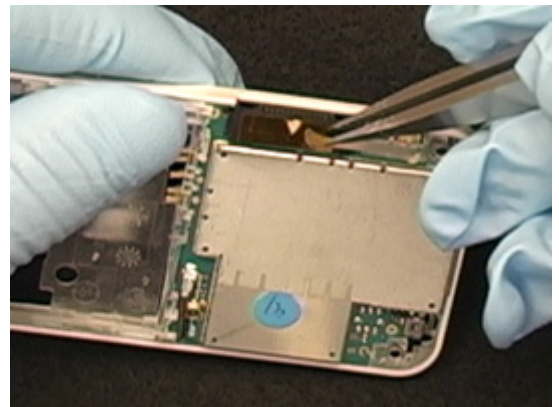


## 2.1.12 PC Board/Antenna assembly Removal from Rear Frame

Use tweezers to remove the power key.

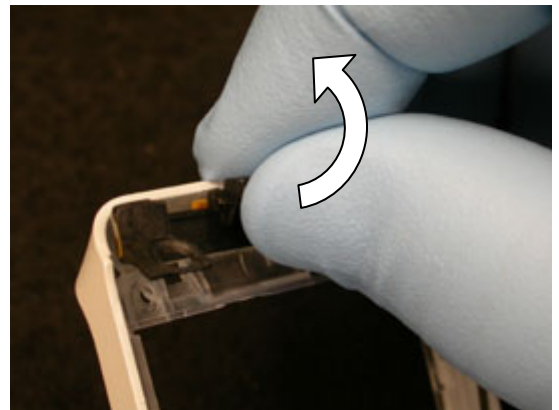


Use tweezers to remove the Bluetooth tape.



Grip the middle of the antenna assembly and rotate it away from the circuit board to free the antenna from the rear frame

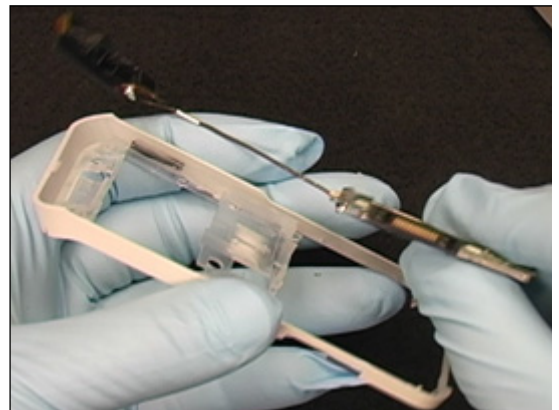
Leave the antenna sitting on the rear frame over its cavity.



Use a pry tool to release the board from the latches beside the SIM connector.



Lift the circuit board, coaxial cable, and antenna as one unit from the rear frame.



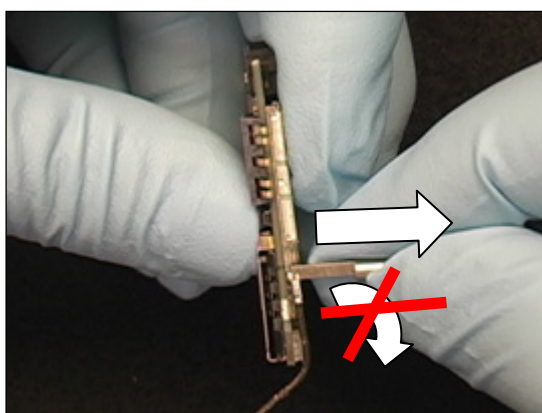
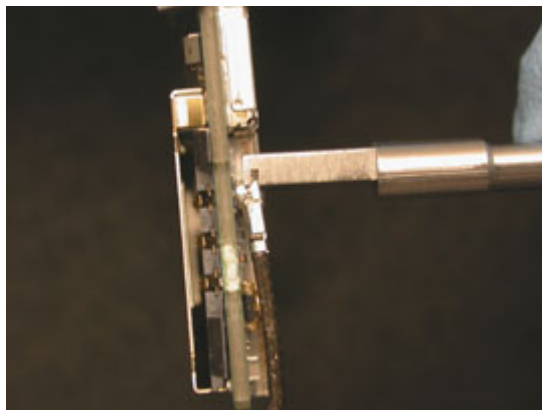
## 2.1.13 Antenna/Cable Assembly Removal from PC Board

**NOTE: USE THE REMOVAL TOOL OR THE BOARD CONNECTOR MAY BE DAMAGED.**

Insert the slot of the tool onto the end of the coaxial cable connector.

Pull the connector directly away from the PC board.

**NOTE: DO NOT ROTATE.**





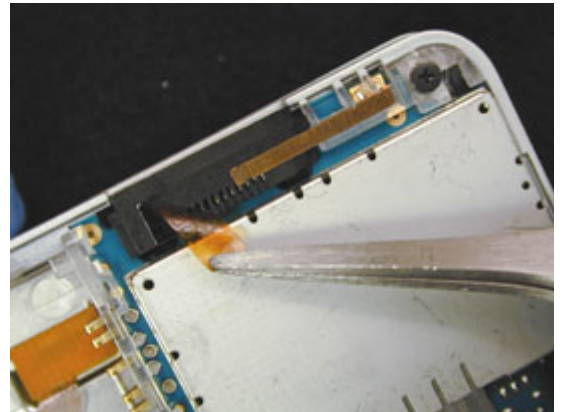
## 3 Part Replacement

### 3.1 Bluetooth Antenna

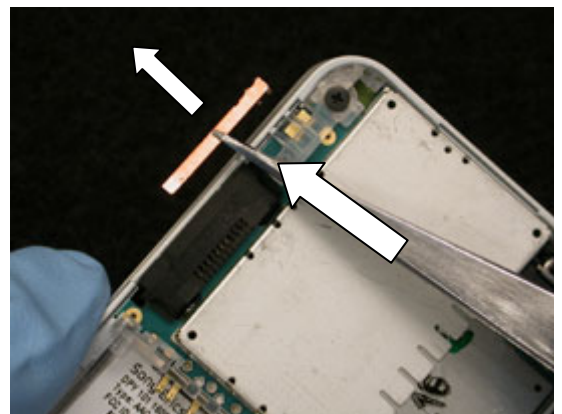
*Remove the battery cover, battery, and upper rear cover as instructed in disassembly procedure 2.1.1, 2.1.2, and 2.1.8.*

#### Removal

Remove the Bluetooth tape using tweezers.

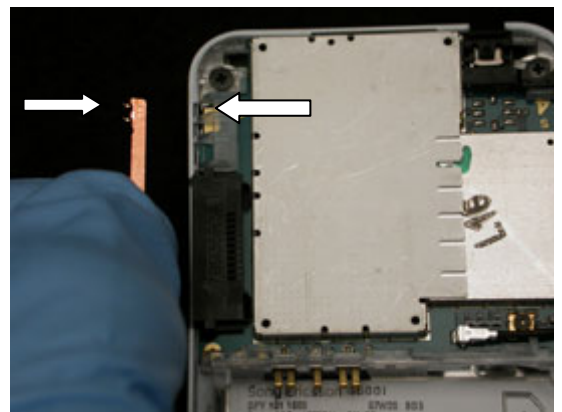


Remove the Bluetooth antenna from the rear frame by sliding it toward the edge of the frame.



#### Installation

Insert the bent pins of the antenna into the slots of the frame.

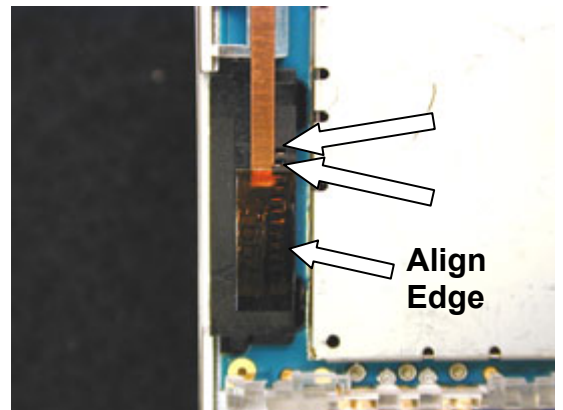


Using a nylon pointer, push the antenna into place.



Install the Bluetooth tape using tweezers. Align the tape with the inside edge of the system connector and leave two holes exposed.

Reinstall the upper rear cover, battery, and battery cover as instructed in reassembly procedure 4.1.5, 4.1.12, and 4.1.13.



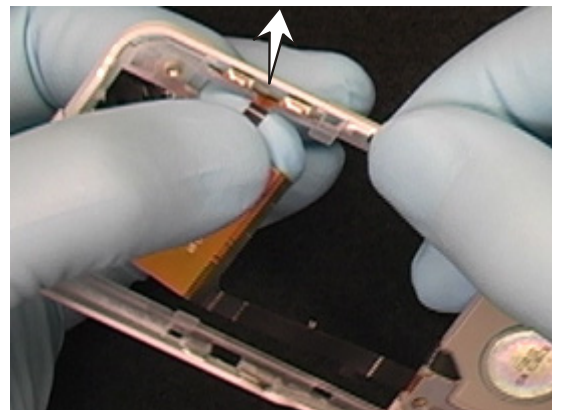
## 3.2 Bonzer Flex

### Removal

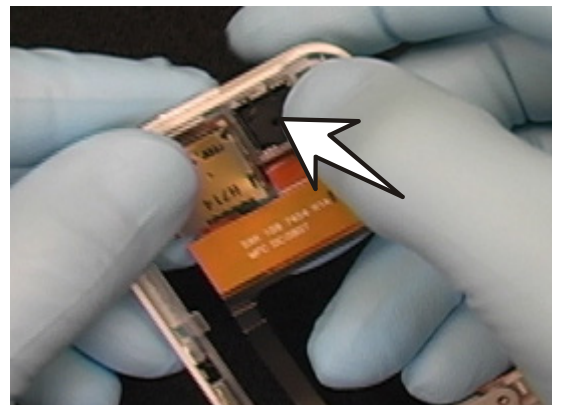
Perform sections 2.1.1-2.1.7 of the disassembly procedure

Perform the removal portion of the Volume Key Replacement procedure

Pull the volume key switches out of the slot of the front frame.

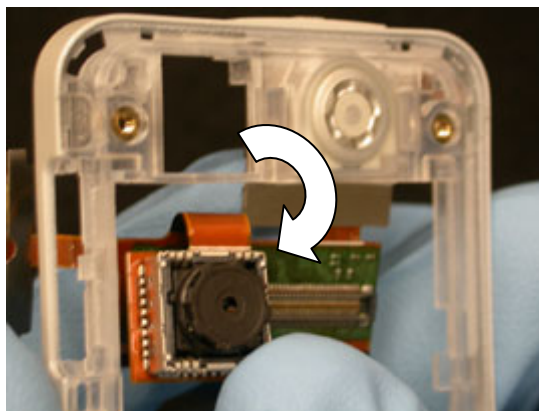


Push the camera out of its cavity.

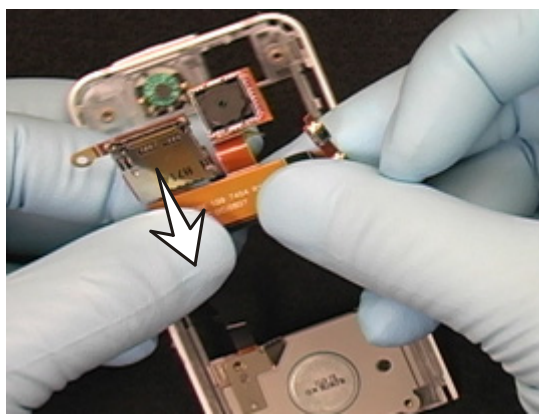




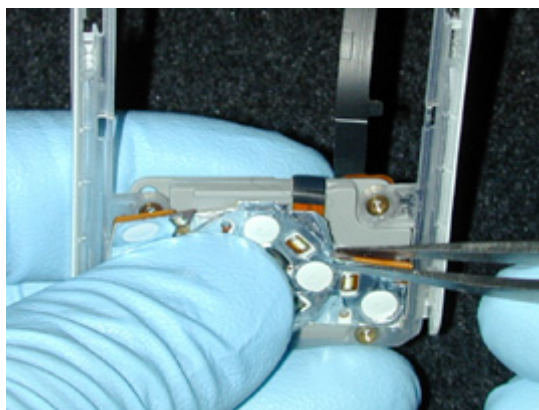
Fold the camera portion of the flex in front of the LCD connector.



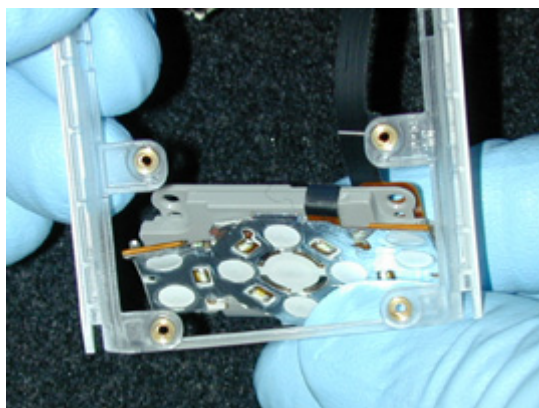
Lift the portion of the flex containing the memory stick holder from the front frame.



Fold the top corners of the dome foil a small amount off the speaker box.



Push the bottom of the speaker box from the frame.



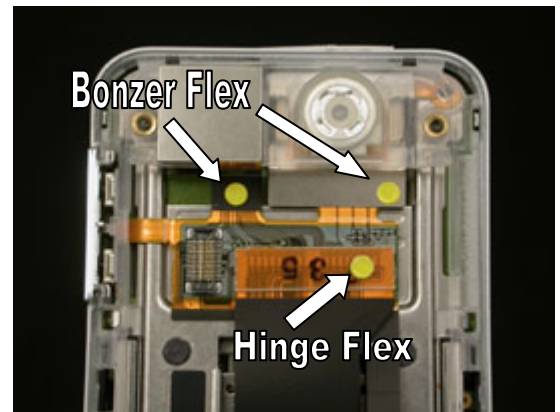




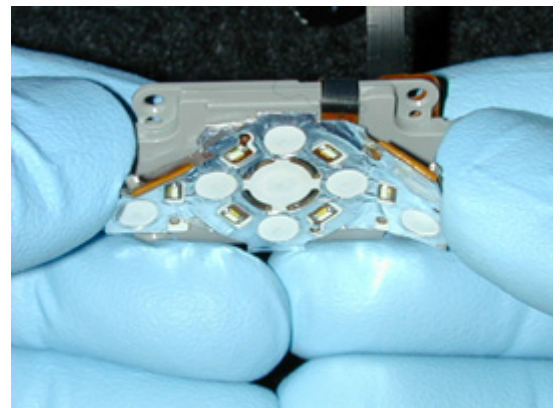
## Installation

Obtain a new bonzer flex of the correct connector type.  
Use the colored dots on the flexs to determine with bonzer flex can be used with which hinge flex:

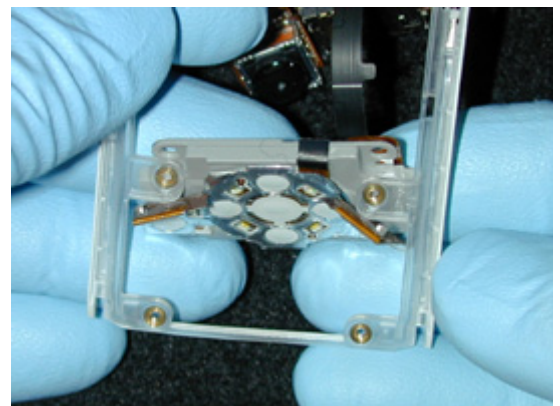
- If the **hinge flex has no dot or a pink dot**, replace both the Bonzer flex and the hinge flex with a yellow dotted Bonzer flex and a white dotted hinge flex.
- If the **hinge flex has a white dot or a yellow dot**, use a **bonzer flex with a yellow dot**.



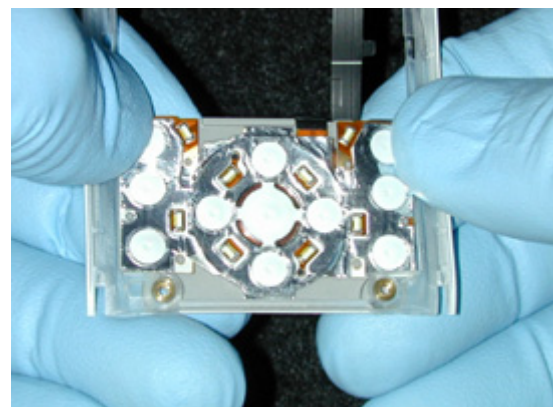
Fold the top corners of the dome foil a small amount off the speaker box.



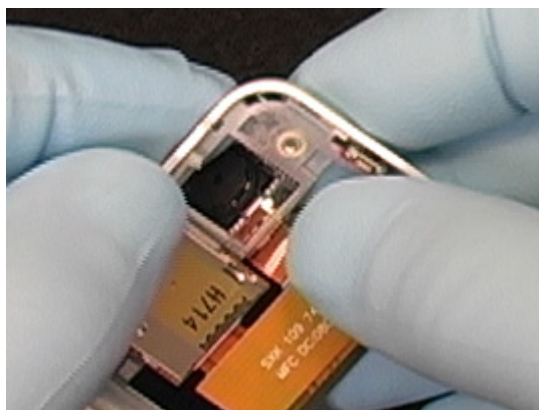
Insert the top of the navigation keypad/ speaker box into the cavity on the frame with the keypad in front of the frame and the speaker box in back of the frame.



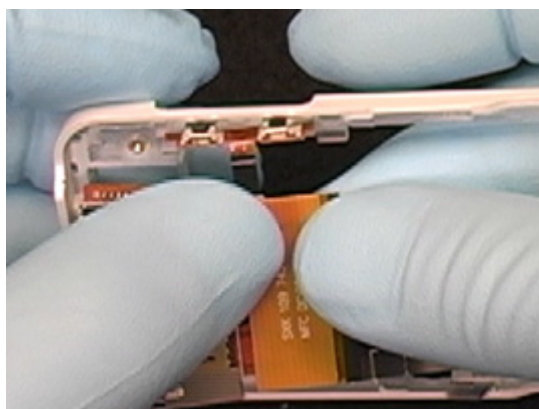
Fold the top corners of the navigation keypad down onto the frame.



Insert the camera into its cavity.



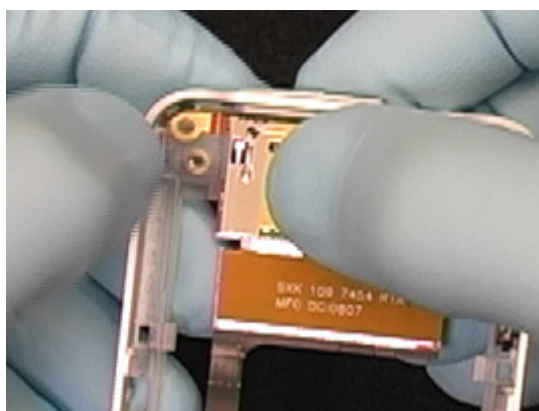
Insert the volume switches into their cavity.



Place the memory stick holder portion of the flex within its retaining features in the front frame.

*Perform the installation portion of the Volume Key Replacement procedure*

*Perform the reassembly procedure starting at section 4.1.7*





### 3.3 Camera

*If the camera needs replacing, replace the entire Bonzer flex. See 3.2 Bonzer Flex Replacement.*

### 3.4 Camera Cover

#### Removal

*Perform sections 2.1.4 - 2.1.5 of the disassembly procedure.*

Obtain a new Camera Cover.

#### Installation

**NOTE: DO NOT REUSE CAMERA COVER**

*Perform sections 4.1.9 - 4.1.10 of the reassembly procedure.*

### 3.5 Chin Cover

#### Removal

*Perform section 2.1.10 of the disassembly procedure.*

Obtain a new Chin Cover.

#### Installation

*Perform section 4.1.6 of the reassembly procedure.*



## 3.6 Coaxial Cable and Antenna

### Removal

*Perform sections 2.1.4 - 2.1.13 of the disassembly procedure.*

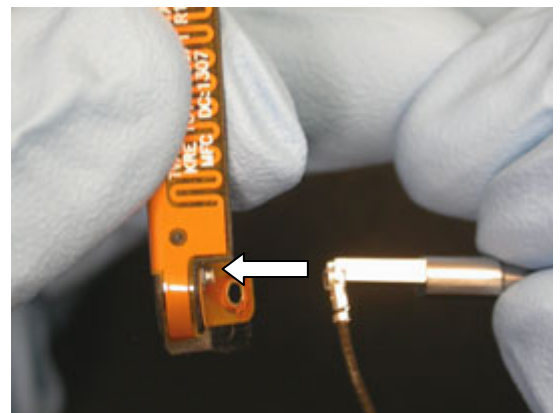
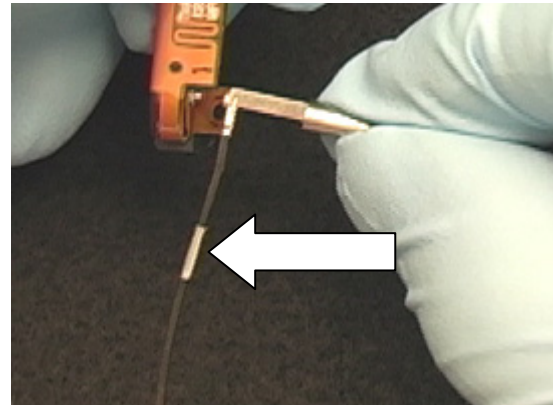
**NOTE: IF THE COAXIAL CABLE CONNECTOR IS REMOVED FROM THE ANTENNA, THEN THE ANTENNA MUST BE REPLACED.**

### Installation

**NOTE: CONNECT THE END OF THE COAXIAL CABLE TO THE ANTENNA THAT HAS THE METAL SLEEVE CLOSEST TO IT**

Insert the connector into the slot of the tool, and then snap the connector onto the antenna.

*Perform sections 4.1.1 – 4.1.13 of the reassembly procedure*



## 3.7 Front Cover

### Removal

*Perform section 2.1.4 of the disassembly procedure.*

### Installation

Obtain a new Front Cover.

*Perform section 4.1.10 of the reassembly procedure.*



## 3.8 Front Frame

### Removal

*Perform sections 2.1.1 -2.1.7 of the disassembly procedure.*

*Perform the removal portion of the Volume Key  
Replacement procedure*

*Perform the removal portion of the Bonzer Flex  
Replacement procedure*

*Perform the removal portion of the Receiver and Gasket  
Replacement procedure*

*Obtain a new Front frame.*

### Installation

*Perform the installation portion of the Receiver and Gasket  
Replacement procedure*

*Perform the installation portion of the Bonzer Flex  
Replacement procedure*

*Perform the installation portion of the Volume Key  
Replacement procedure*

*Perform the reassembly procedure starting at section 4.1.7*







## 3.9 Hinge Assembly

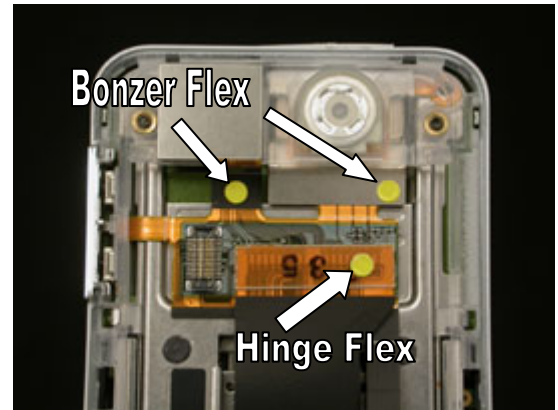
### Removal

Perform sections 2.1.1 -2.1.11 of the disassembly procedure

### Installation

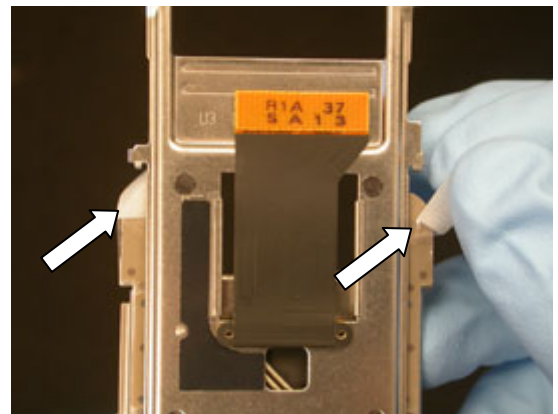
Obtain a new hinge assembly with the correct connector type on the hinge flex. Use the colored dots on the flexes to determine with hinge flex can be used with the bonzer flex in the phone:

- If the **Bonzer flex has no dot or a pink dot**, replace both the Bonzer flex and the hinge flex with a yellow dotted Bonzer flex and a white dotted hinge flex.
- If the **Bonzer flex has a white dot or a yellow dot**, use a hinge flex with a white dot.



Remove the protective tape covers from the Teflon tape.

**NOTE: OPEN AND CLOSE THE HINGE ONLY WHEN NECESSARY. KEEP BOTH HALVES OF THE HINGE AS PARALLEL AS POSSIBLE WHEN OPENING AND CLOSING TO PREVENT DAMAGING THE TEFLON TAPE.**



Perform the installation portion of the Wear Strip Replacement procedure

Perform sections 4.1.3 -4.1.13 of the reassembly procedure

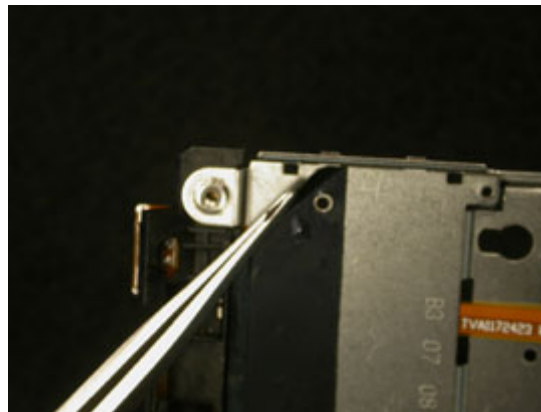


## 3.10 Hinge Tape

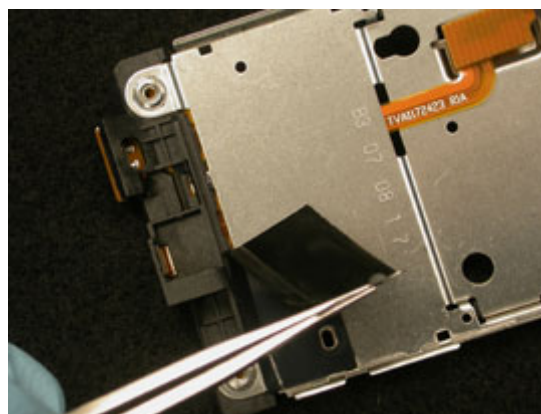
### Removal

*Perform sections 2.1.1-2.1.11 of the disassembly procedure.*

Peel up a corner of the tape using round tipped tweezers.



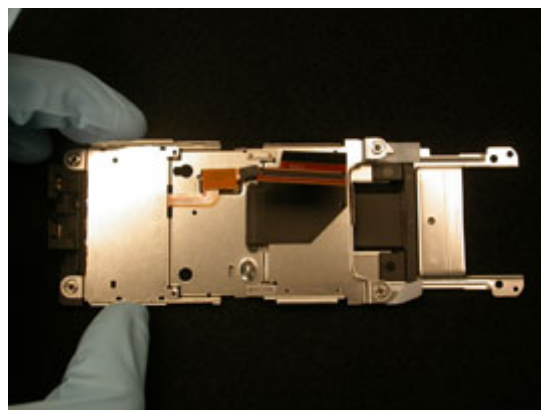
Peel the rest of the tape off.



### Installation

Obtain a new piece of hinge tape.

Open the hinge.



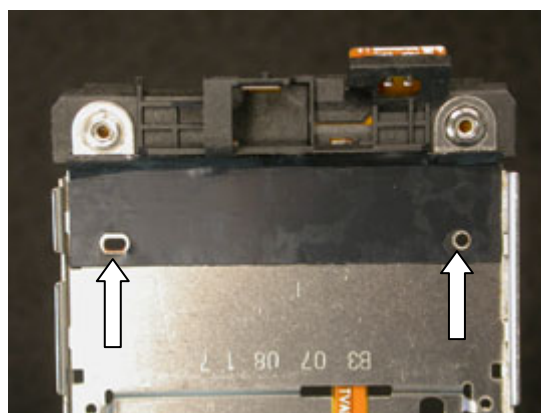
Insert a dental pick through the hole in the hinge shown.



Lay the hinge tape onto the hinge using the dental pick as guide.



Smooth the tape onto the hinge . Ensure the holes in the tape match up with both hinge holes.



*Perform sections 4.1.3 -4.1.13 of the reassembly procedure*

## 3.11 Keypad

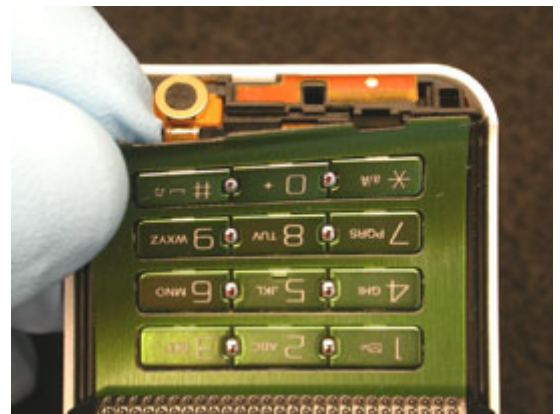
### Removal

Remove the Chin Cover and microphone gasket as instructed in section 2.1.10 of the disassembly procedure.

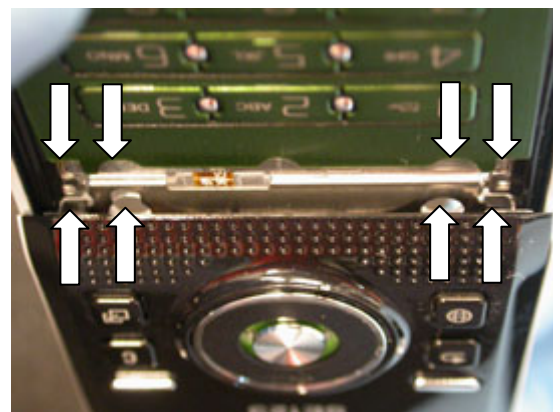
Use a plectrum to lift a corner of the keypad enough to grip onto the keypad.



Carefully peel the keypad off the hinge assembly.



Align the tabs and notches on the keypad with the tabs and holes indicated on the hinge assembly.



Apply pressure over the surface of the keypad so that a good bond to the hinge assembly occurs.

*Reinstall the microphone gasket and chin cover as instructed in section 4.1.6 of the reassembly procedure.*



## 3.12 LCD Assembly

### Removal

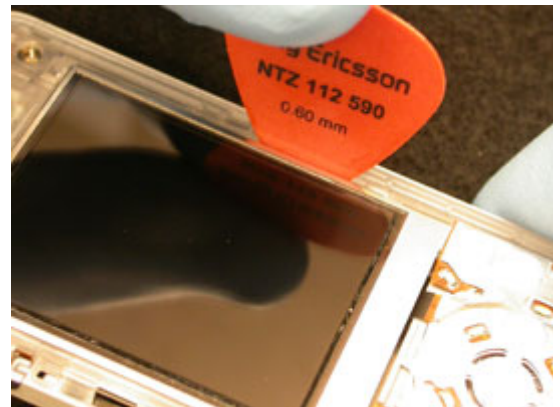
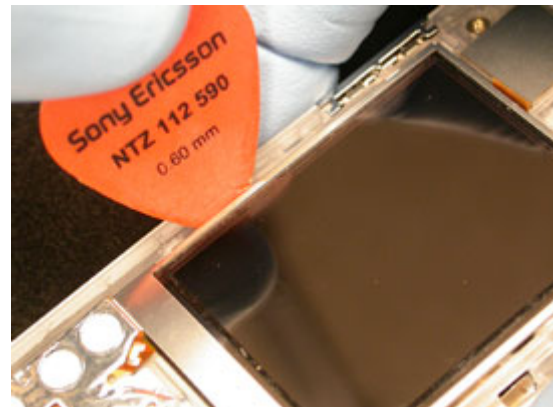
Remove the Front Cover as instructed in section 2.1.4 of the disassembly procedure.

Insert the tip of the plectrum between the left side of the LCD assembly and the front frame.

Rotate the plectrum away for the LCD to release the lower left side retention feature.

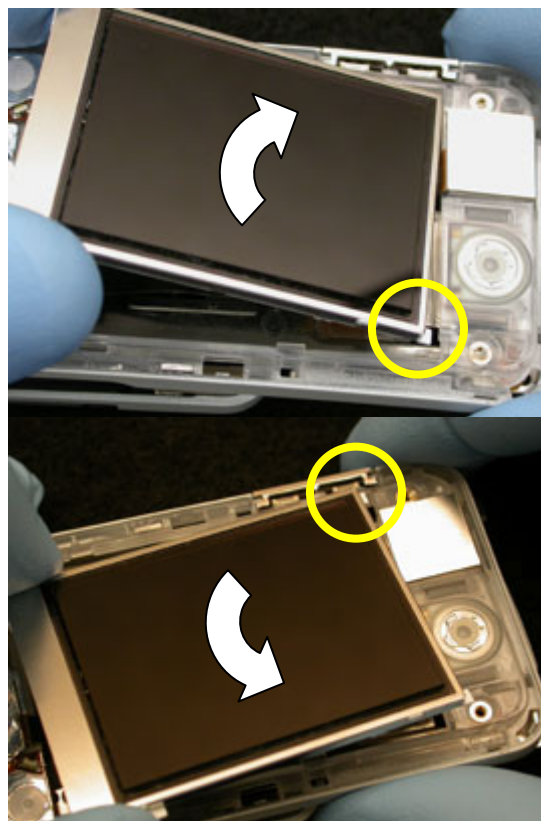
Insert the tip of the plectrum between the right side of the LCD and the front frame.

Rotate the plectrum away for the LCD to release the lower right side retention feature.

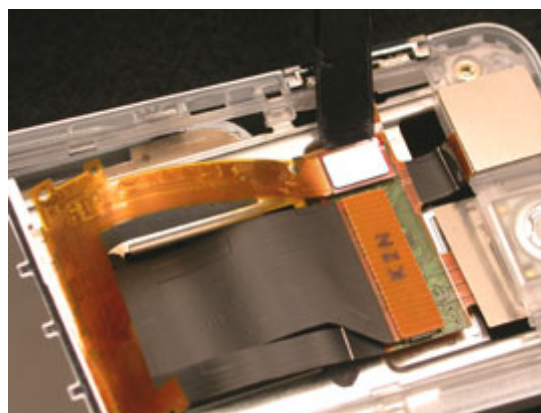




Free the upper two LCD retention features by wiggling to LCD to the left and right.

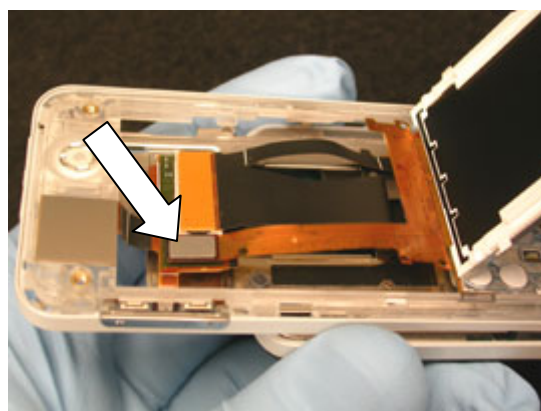


Once free, lift the LCD assembly out of the way and detach its flex connection using a pry tool.



### **Installation**

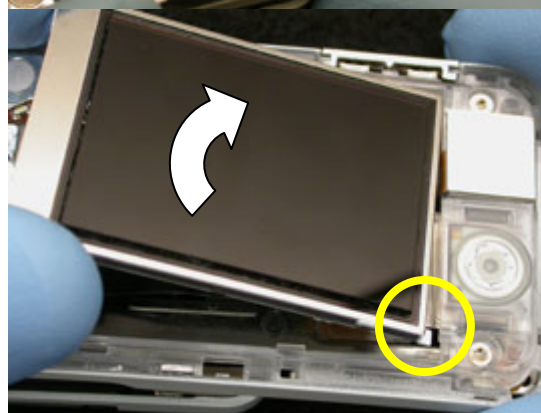
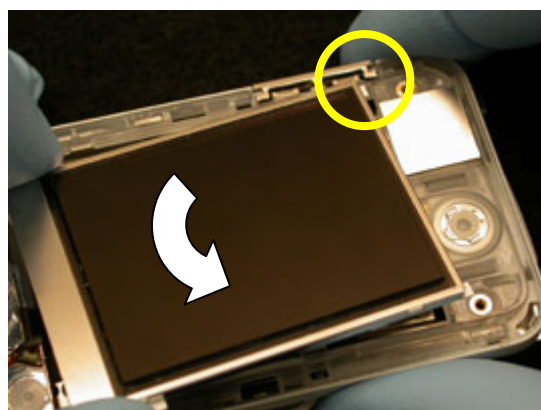
Orient the LCD as shown and plug the LCD's flex into the bonzer flex.



Fold the LCD so that it lays over its cavity.



Insert the upper two LCD retention features into their slots in the front frame by wiggling the LCD to the right and then the left.



Insert the tip of the plectrum between the left side of the LCD assembly and the front frame.



Rotate the plectrum towards the LCD to insert the lower left side retention feature into its slot in the front frame.



Insert the tip of the plectrum between the right side of the LCD and the front frame.



Rotate the plectrum towards the LCD to insert the lower right side retention feature into its slot in the front frame.

*Reinstall the front cover as instructed in section 4.1.10 of the reassembly procedure.*



### 3.13 LCD Bezel

#### Removal

*Remove the Front Cover as instructed in section 2.1.4 of the disassembly procedure.*

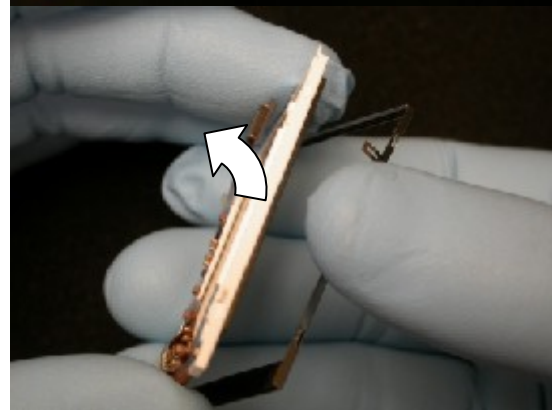
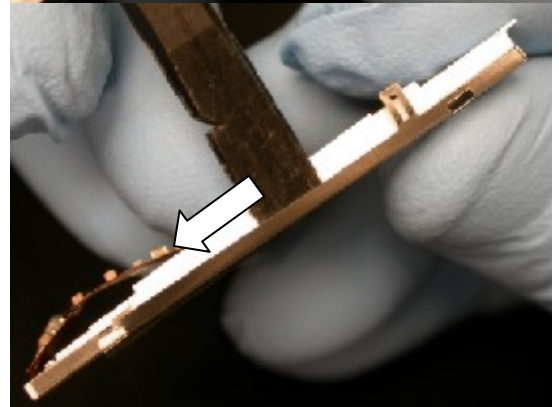
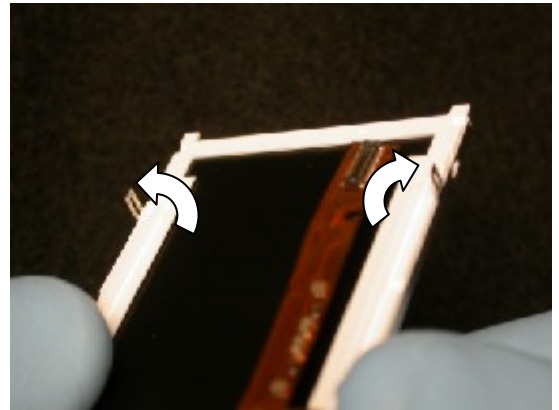
*Remove the LCD assembly according to the removal portion of the LCD assembly replacement procedure.*

Bend the two metal tabs of the bezel so they are not over the back of the LCD.

Insert the flat end of the nylon pointer between the bezel and the LCD at one of the two metal tabs.

Slide the nylon pointer towards the bottom of the LCD until the two latches holding the bezel in place along that side are released.

Rotate the freed side of the LCD away from the bezel and lift the LCD out of the old bezel.

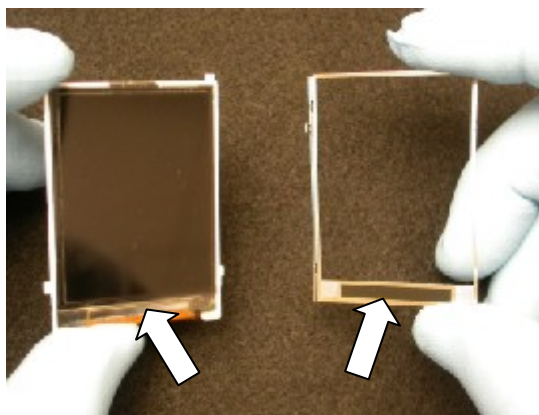




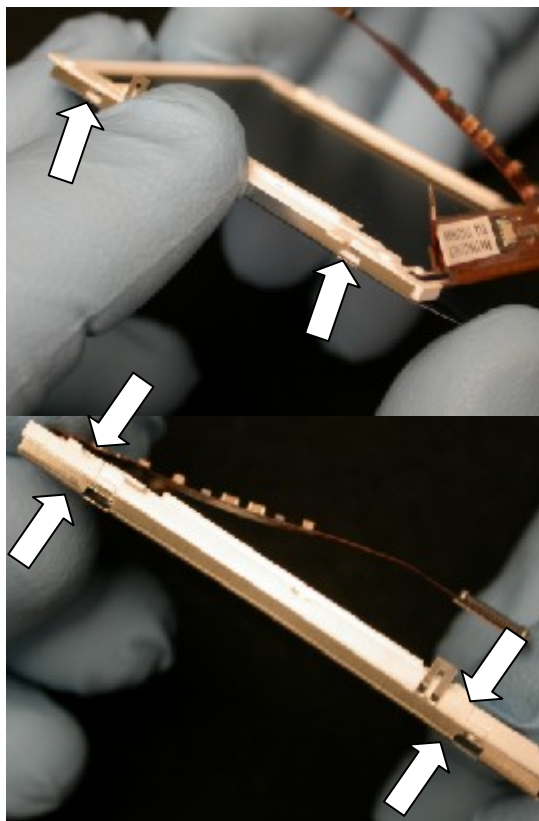
**Installation**

Obtain a new LCD bezel.

Orient the bezel so that its wide edge aligns with the bottom edge of the LCD.



Insert one side of the LCD in the bezel so that the latches on the side of the LCD align with the corresponding slots in the bezel.



Finish snapping the bezel onto the LCD by pressing the other side of the LCD and bezel together.

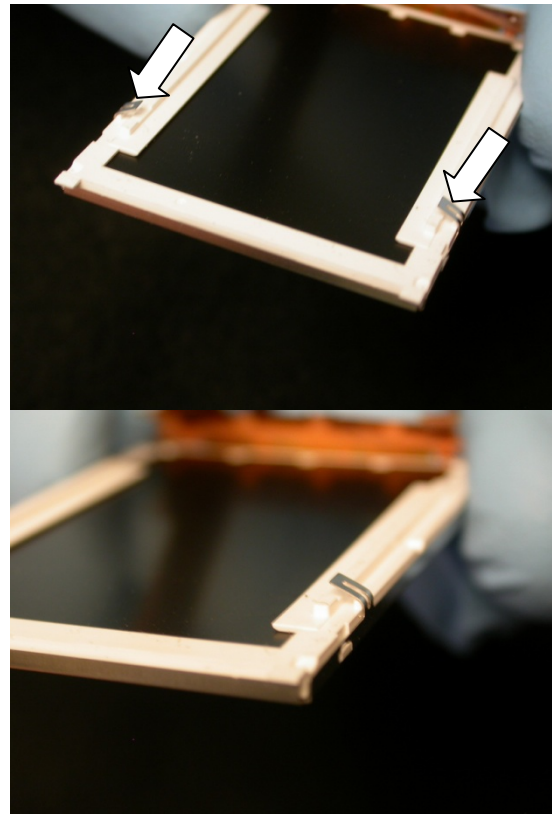


Bend the bezel's two metal tabs over the back the LCD using your thumbs.

**NOTE: ONCE BENT, THE TWO METAL TABS SHOULD STICK UP AT A 30 TO 45 DEGREE ANGLE FROM THE BACK OF THE DISPLAY.**

*Reinstall the LCD assembly according to the Installation portion of the LCD assembly replacement procedure*

*Reinstall the front cover as instructed in section 4.1.10 of the reassembly procedure.*



### 3.14 LCD Gasket

*Refer to the Front Cover Installation portion of the reassembly procedure for instructions on replacing the LCD gasket.*

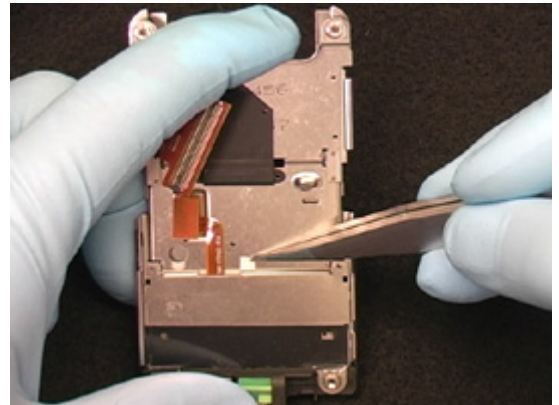


## 3.15 Liquid Intrusion Indicator

### Removal

Perform sections 2.1.1 -2.1.11 of the disassembly procedure

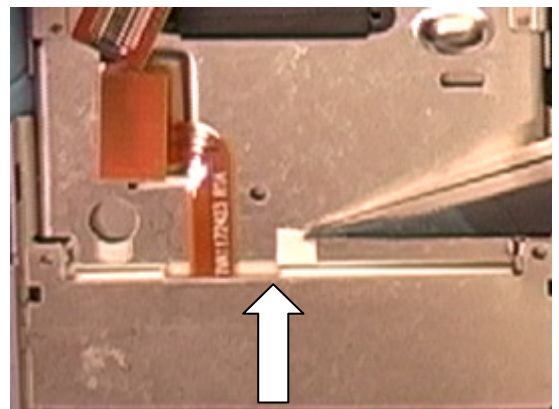
Remove the old liquid intrusion indicator.



### Installation

Align the bottom, left corner of the new indicator with the edge of the slot in the hinge.

Perform sections 4.1.3 -4.1.13 of the reassembly procedure



## 3.16 Main Keypad Flex

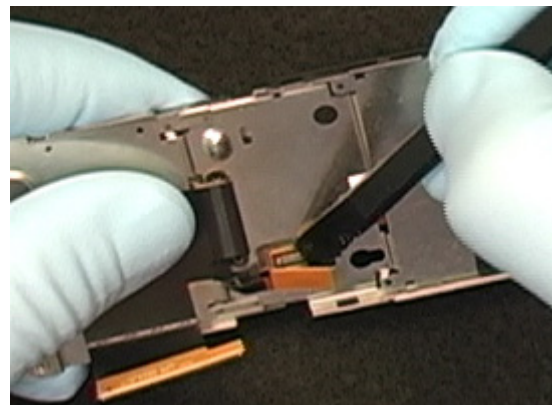
### Removal

**NOTE: THE MAIN KEYPAD FLEX CANNOT BE REUSED!**

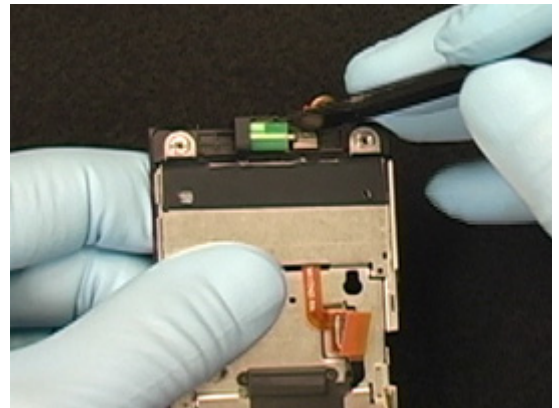
Perform sections 2.1.1 -2.1.11 of the disassembly procedure.

Perform the removal portion of the Keypad Replacement procedure

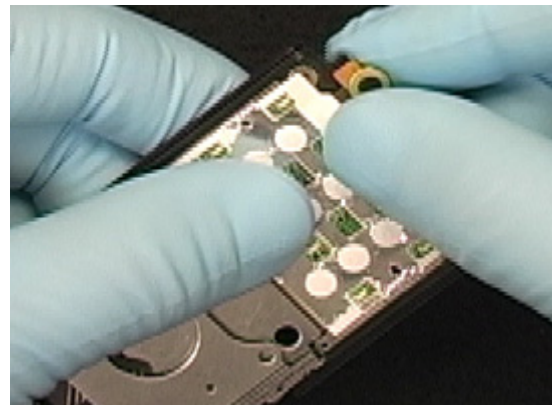
Use a pry tool to disconnect the flex connection.



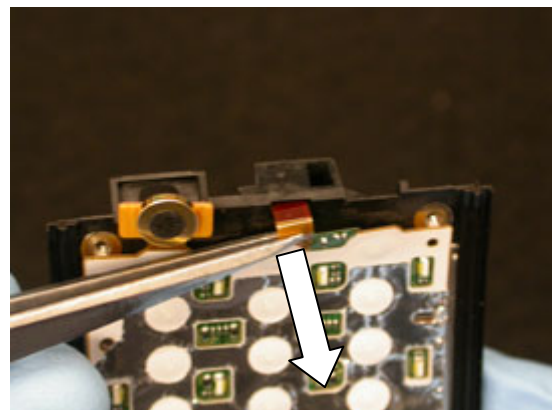
Use a pry tool to remove the vibrator.



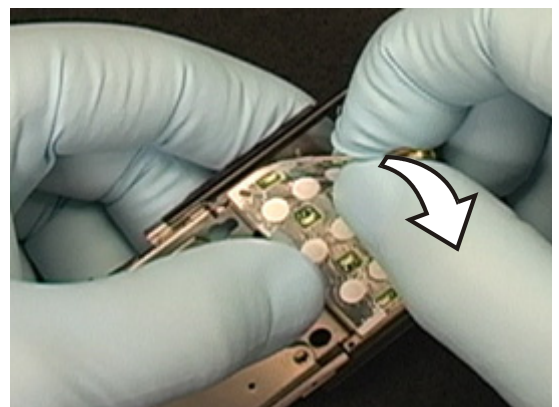
Lift the microphone flex off the hinge.



Pull the vibrator pads through the slot in the hinge.

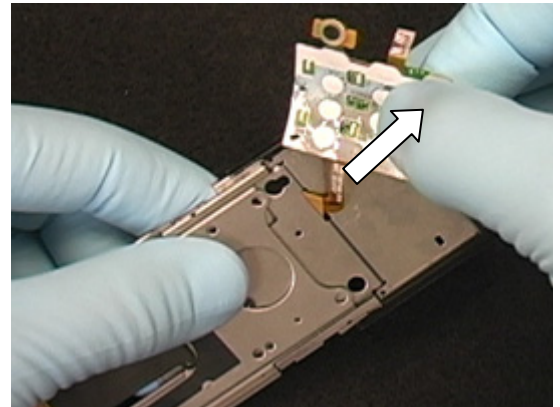


Peel the dome foil off the hinge.





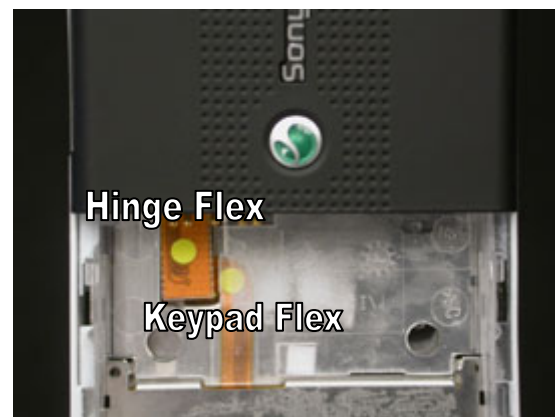
Pull the flex connector through the hole in the hinge.  
 Remove any adhesive residue from the hinge assembly.  
*Remove the microphone from the old keypad flex by performing the removal portion of the Microphone Replacement procedure*



### Installation

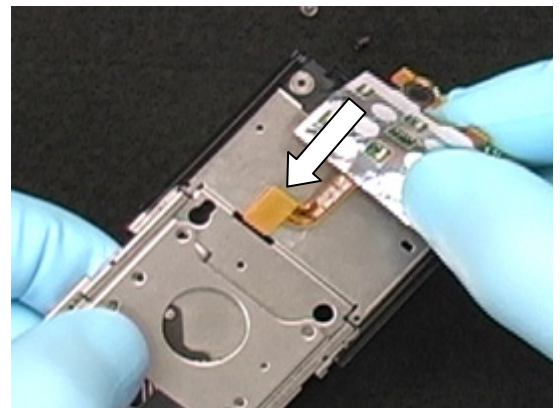
Obtain a new main keypad flex.

**NOTE: THE COLORED DOT COMBINATION BETWEEN ON THE HINGE FLEX AND MAIN KEYPAD FLEX DOES NOT MATTER. ANY COLOR COMBINATION WILL WORK.**



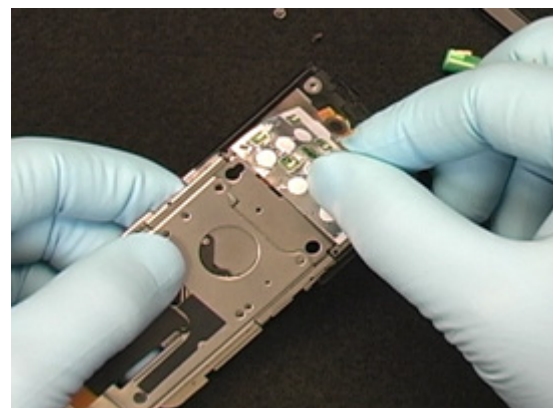
*Install the microphone in the new keypad flex by performing the installation portion of the Microphone Replacement procedure*

Push the flex connector through the hole in the hinge.

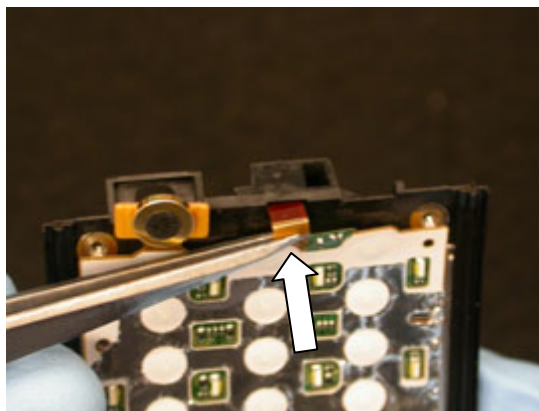


Using the features around the hinge assembly's keypad area for alignment, place the keypad flex on the hinge.

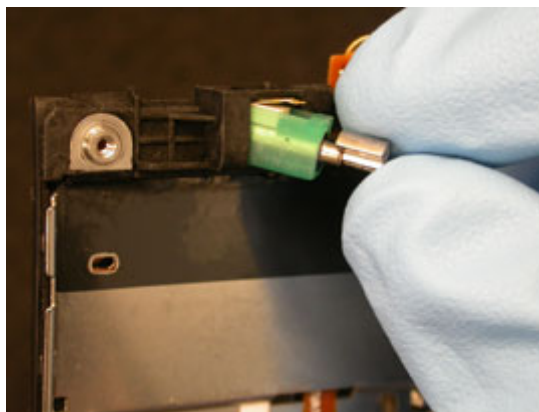
Apply pressure over the dome foil portion of the keypad flex so that a good bond is formed



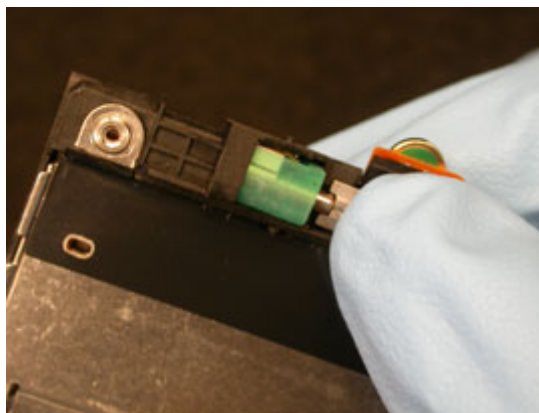
Insert the vibrator connector through the slot.



Orient the vibrator so that its spring fingers are toward the vibrator contact pads and insert the vibrator into its cavity.



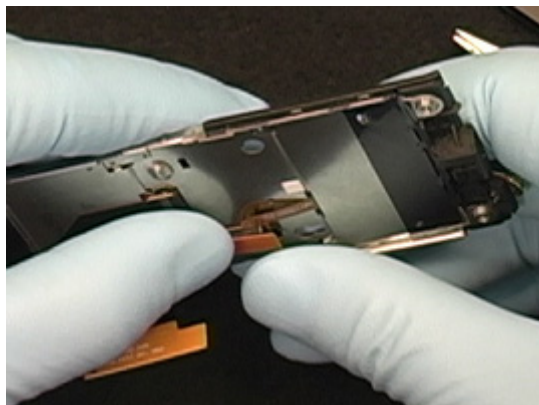
Push the vibrator down into place.



Plug the keypad flex to the hinge flex.

*Perform sections 4.1.3 -4.1.13 of the reassembly procedure*

*Perform the installation portion of the Keypad Replacement procedure*



## 3.17 Memory Stick Cover

### Removal

*Remove the front cover and camera cover as shown in sections 2.1.4 - 2.1.5 of the Disassembly procedure.*

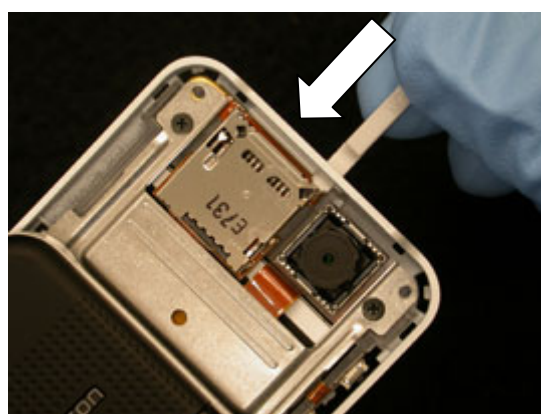
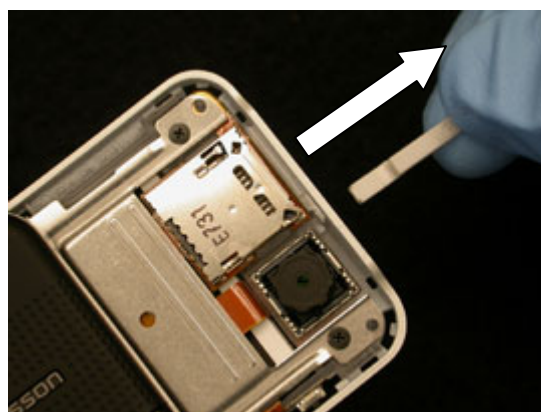
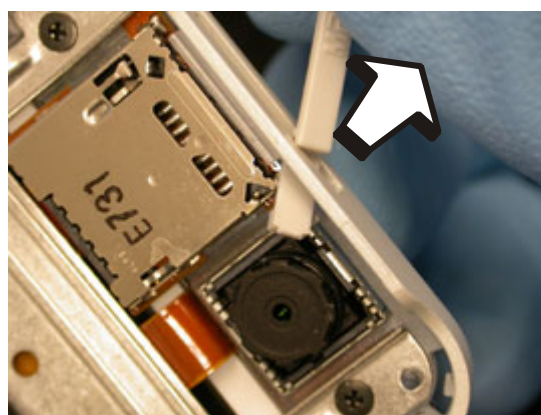
Pull the memory stick cover out of its cavity.

Rotate the memory stick cover down to free the inside latch from the peg on the frame.

Pull the cover out of the hole.

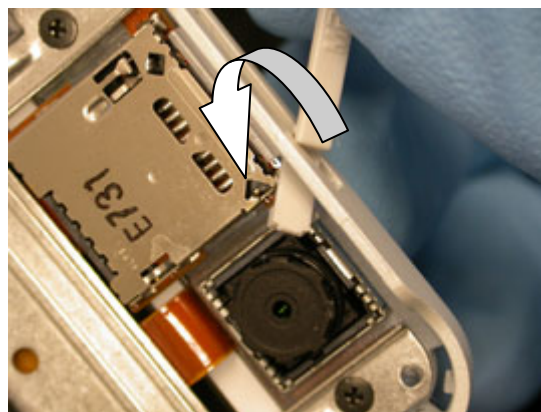
### Installation

Insert the tabbed end of the cover through the hole.

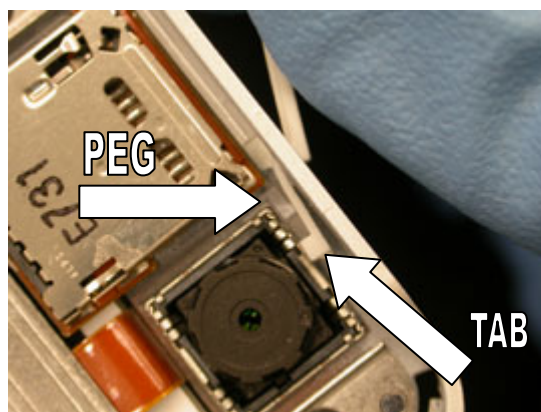




Twist the cover and push the tab down behind the peg on the carrier.



Make sure the tab is behind the peg.



Push the cover into its cavity.

*Replace the Camera Cover and Front Cover as in 4.1.9-4.1.10 of the reassembly procedure.*





## 3.18 Microphone

### Removal

*Remove the Chin Cover and Microphone Gasket as shown in section 2.1.10 of the Disassembly procedure.*

*Perform the removal portion of the Keypad Replacement procedure*

Insert a plectrum between the microphone and the flex.

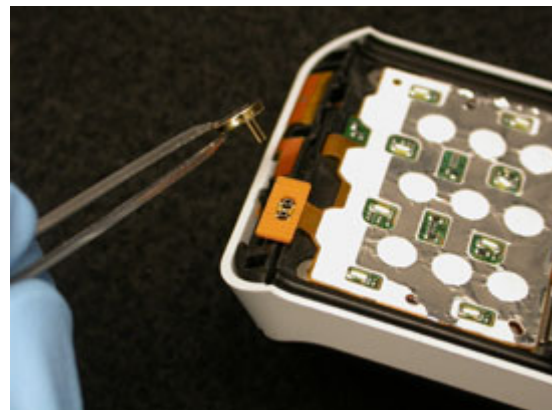
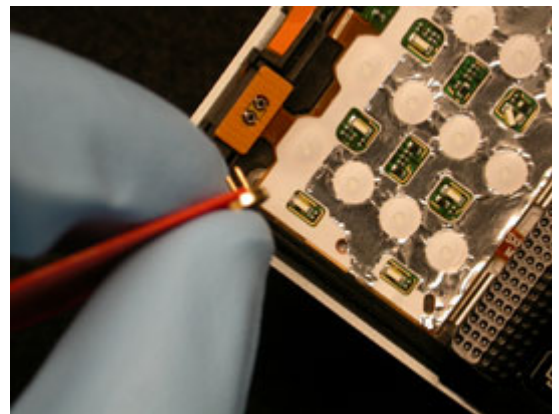
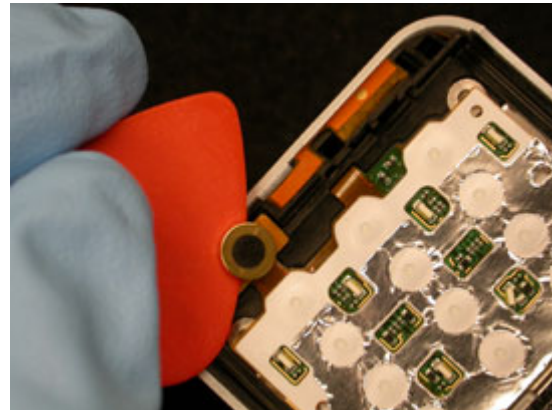
Hold the flex with one finger while working the microphone pins out of the holes.

**NOTE: LIMIT THE AMOUNT OF STRESS ON THE KEYPAD FLEX WHEN REMOVING THE MICROPHONE.**

### Installation

Orient the microphone so the pins are toward the phone and the side of the microphone that its contact pins are closest too is toward the keypad dome foil.

Insert the pins into the holes.

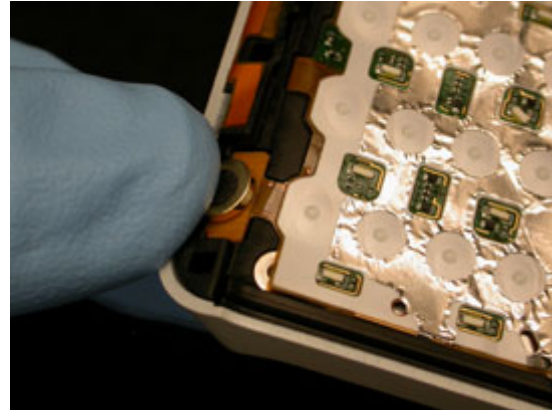




Push the microphone down completely.

*Perform section 4.1.6 of the reassembly procedure*

*Perform the installation portion of the Keypad Replacement procedure*



## 3.19 Microphone Gasket

### Removal

*Remove the chin cover and microphone gasket as instructed in disassembly procedure 2.1.10.*

### Installation

*Install the microphone gasket and the chin cover as instructed in reassembly procedure 4.1.6.*

## 3.20 Navigation Keypad

### Removal

*Remove the battery cover, battery, and front cover as instructed in disassembly procedure 2.1.1, 2.1.2, and 2.1.4.*

### Installation

Obtain a new navigation keypad.

*Reinstall the front cover, battery, and battery cover as instructed in reassembly procedure 4.1.10, 4.1.12, and 4.1.13*

## 3.21 Power Key

### Removal

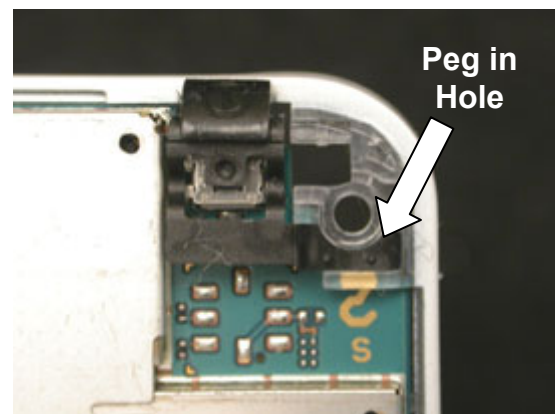
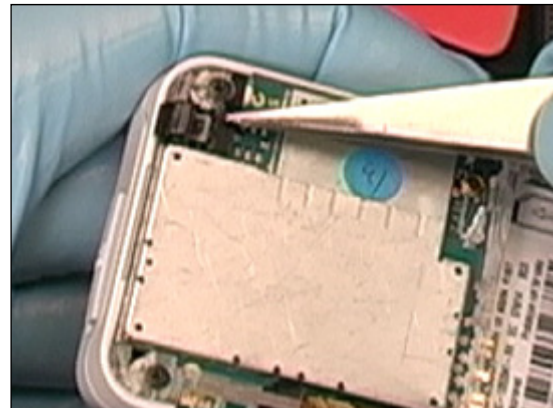
Remove the battery cover, battery, and upper rear cover as instructed in disassembly procedure 2.1.1, 2.1.2, and 2.1.8.

Using tweezers, remove the power key.

### Installation

Insert the peg of the power key into the hole on the rear frame and press power key into place.

*Reinstall the upper rear cover, battery, and battery cover as instructed in reassembly procedure 4.1.5, 4.1.12, and 4.1.13.*



## 3.22 Rear Frame / Pad

### Removal

*Perform sections 2.1.1-2.1.12 of the disassembly procedure*

### Installation

**NOTE: WHEN REPLACING THE REAR FRAME, BE SURE TO INSTALL A COAXIAL CABLE GROUND PAD IN THE COAXIAL CABLE SLOT.**

Using tweezers, align the end of the coaxial cable ground pad with the end of the plastic rail in the frame as shown.

Press the coaxial cable ground pad into the cable slot.

*Perform the reassembly procedure starting at section 4.1.2*



## 3.23 Receiver and Gasket

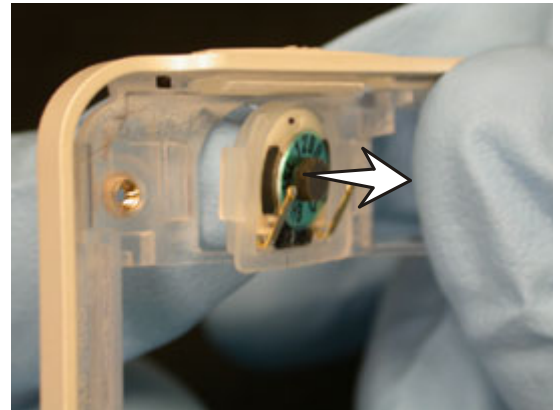
### Removal

*Perform sections 2.1.1-2.1.7 of the disassembly procedure*

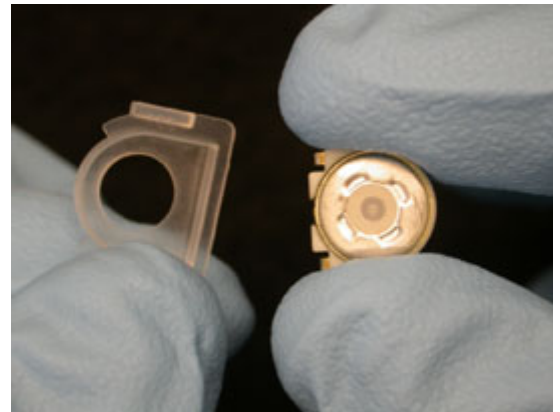
Perform the removal portion of the Volume Key Replacement procedure

Perform the removal portion of the Bonzer Flex Replacement procedure

Push the receiver and gasket out of the cavity on the front frame.



Separate the receiver and the gasket.



### Installation

Insert the receiver into the receiver gasket.

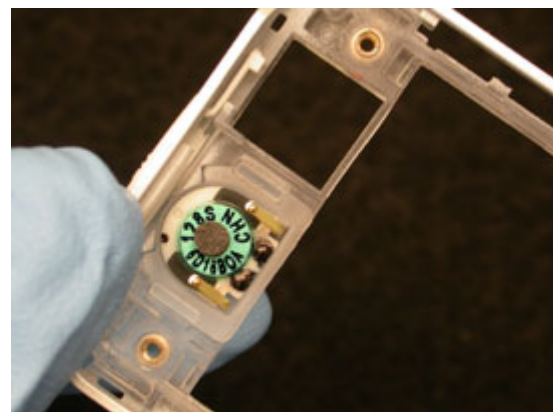


Insert the receiver/gasket assembly into the cavity on the front frame.

*Perform the installation portion of the Bonzer Flex Replacement procedure*

*Perform the installation portion of the Volume Key Replacement procedure*

*Perform the reassembly procedure starting at section 4.1.7*



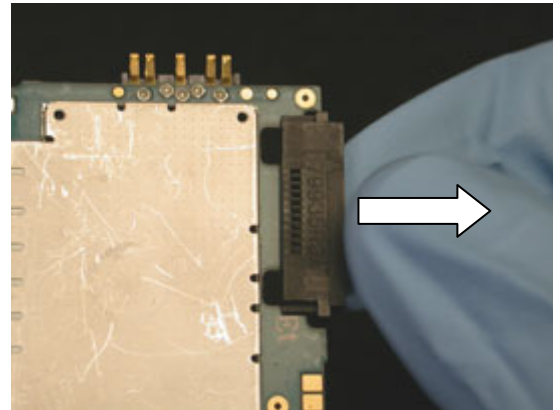


## 3.24 System Connector

### Removal

*Perform sections 2.1.1-2.1.12 of the disassembly procedure*

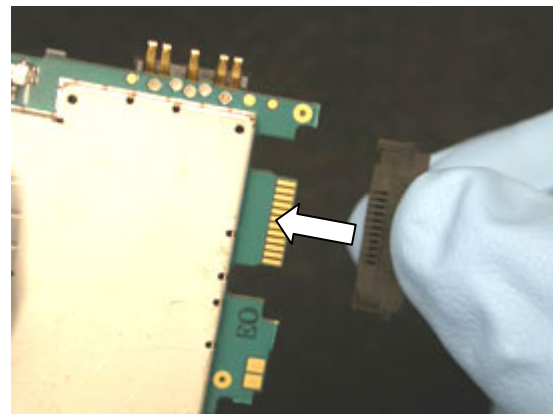
Pull the system connector off of the PC board.



### Installation

Push the system connector onto the PC board.

*Perform the reassembly procedure starting at section 4.1.2*



## 3.25 Upper Rear Cover

### Removal

*Remove the battery cover, battery, and upper rear cover as instructed in disassembly procedure 2.1.1, 2.1.2, and 2.1.8.*

### Installation

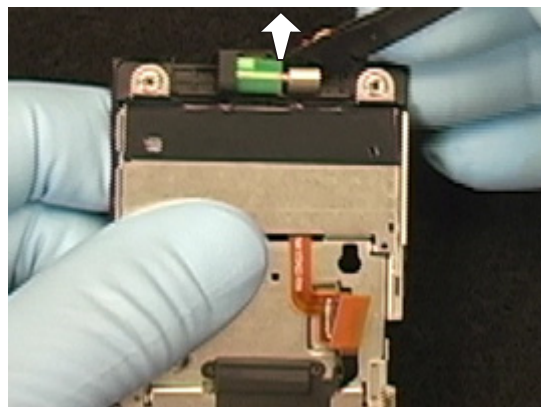
*Reinstall the upper rear cover, battery, and battery cover as instructed in reassembly procedure 4.1.5, 4.1.12, and 4.1.13*

## 3.26 Vibrator

### Removal

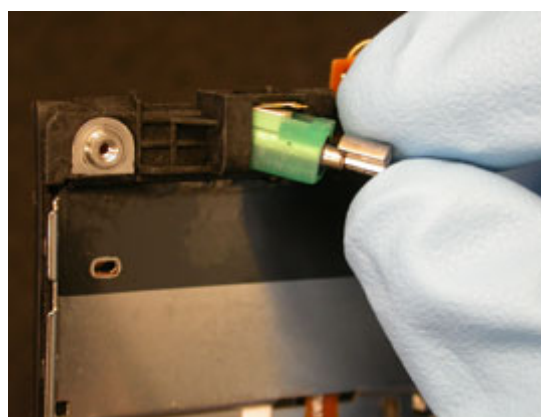
*Perform sections 2.1.1-2.1.11 of the disassembly procedure*

Gently lift the vibrator out of its cavity.



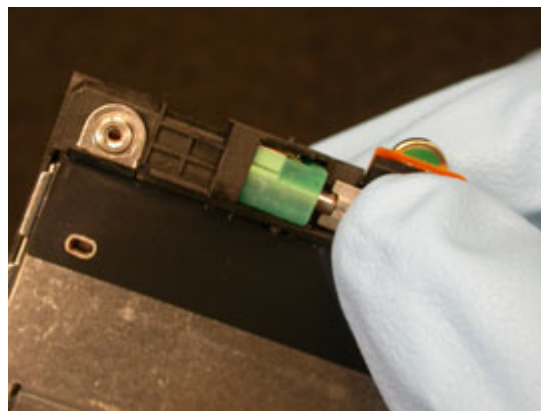
### Installation

Orient the vibrator so that its spring fingers are toward the vibrator contact pads and insert the vibrator into its cavity.



Push the vibrator down into place.

*Perform the reassembly procedure starting at section 4.1.3*

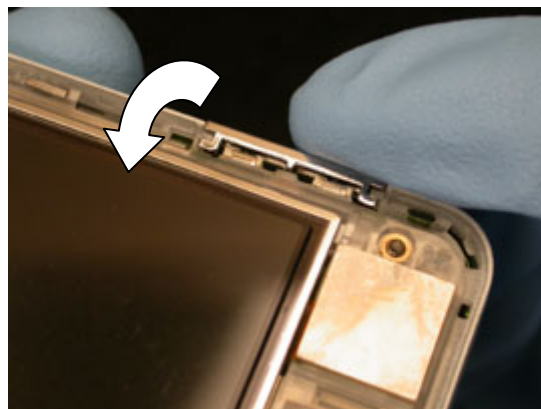


## 3.27 Volume Key

### Removal

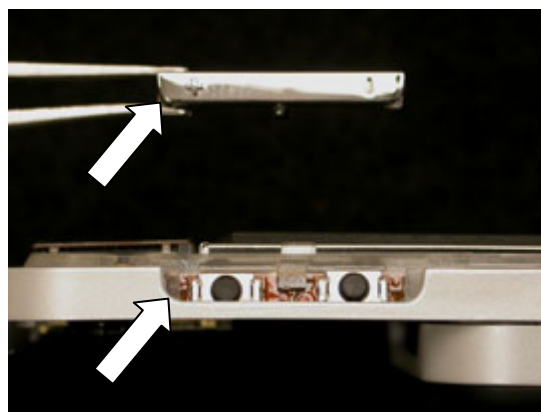
*Remove the front cover as instructed in disassembly procedure 2.1.5*

Lifting from the bottom of the volume key, rotate it towards the display to free it from its cavity.



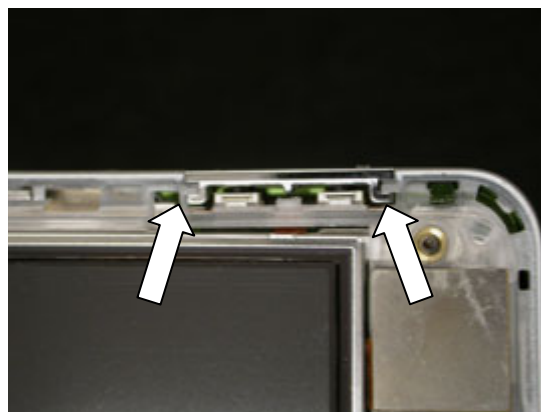
### Installation

Orient the volume key so that the shape of the key corresponds to the shape of its cavity in the frame.



Work the volume key into its opening so that the features at each end of the volume key mate with the features of the frame as shown.

*Reinstall the front cover as instructed in reassembly procedure 4.1.10*



## 3.28 Wear Strips

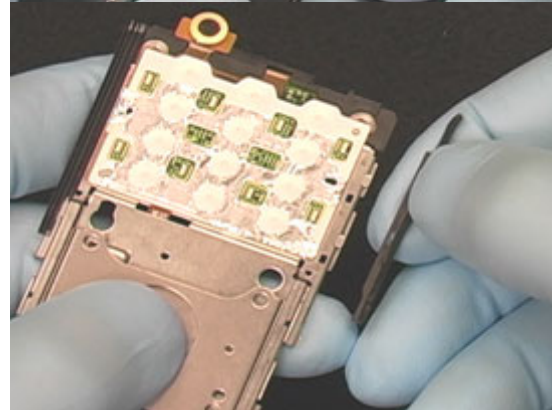
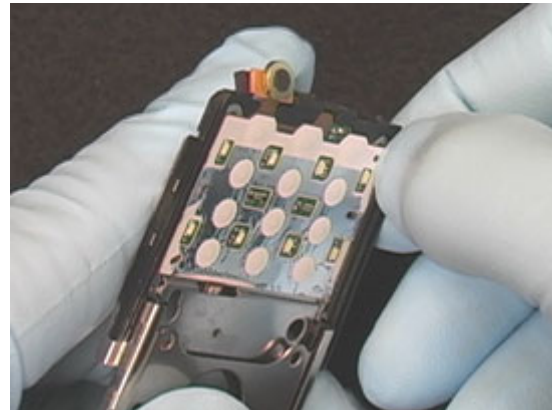
### Removal

*Perform sections 2.1.1-2.1.11 of the disassembly procedure*

**NOTE: DO NOT REUSE WEAR STRIPS!**

Grip the curved end of the wear strip.

Pull the strip off the hinge assembly.

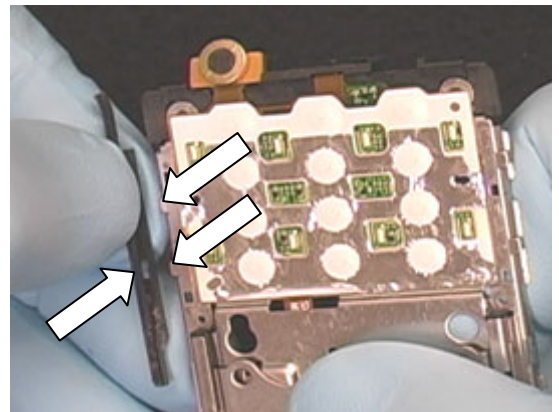


### Installation

**NOTE: THE CURVED END OF THE WEAR STRIPS GO TOWARDS THE END OF THE HINGE ASSEMBLY WHERE THE MICROPHONE IS LOCATED!**

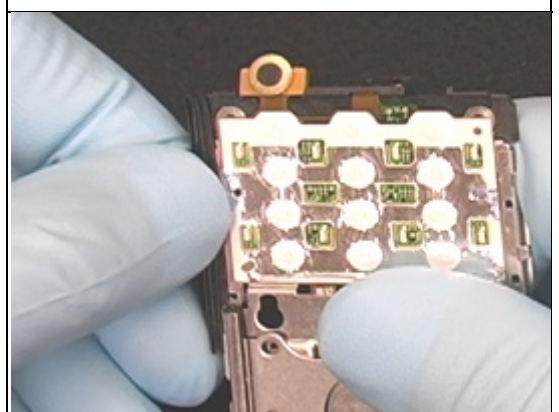
**NOTE: THERE IS A LEFT SIDE WEAR STRIP AND A RIGHT SIDE WEAR STRIP.**

Align the tabs on the hinge assembly with the holes in the wear strip.



Snap the wear strip onto the hinge assembly.

*Perform the reassembly procedure starting at section 4.1.3*





## 3.29 Board Swap – replace swap board

### Removal

Perform sections 2.1.1-2.1.11 of the disassembly procedure

Leave the antenna assembly in the frame as well as the system connector and the BT connector. Be carefully with the BT tape.

### Replace

Replace with a swap board

### Installation

Reinstall as instructed in reassembly procedure 4.1.1 to 4.1.13



## 3.30 Board Swap – Change Label

### CHANGE LABEL

Follow the instructions in the Generic Repair Manual – Build swap for change of label.

## 3.31 Board Swap – Customize Software

### CUSTOMIZATION OF SOFTWARE

Follow the instructions in the Generic Repair Manual – Build swap for customization of the software

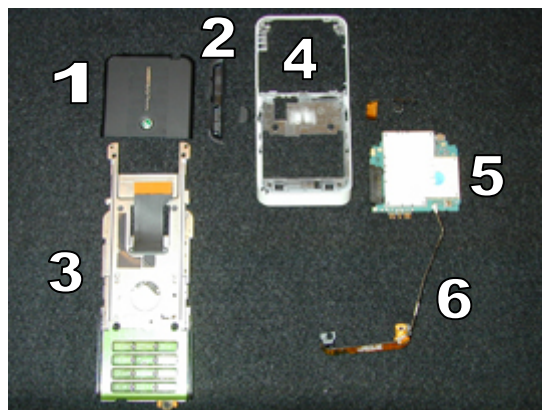
## 4 Reassembly

### 4.1 Overview

Perform the reassembly in the following order:

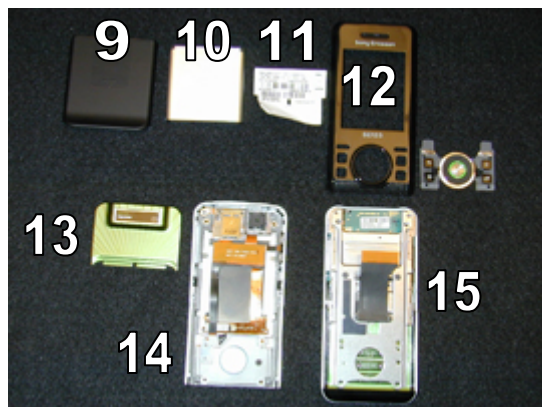
#### Lower half of phone

- Attach antenna/coax cable assembly(6) to PC Board (5)
- Install PC Board/Antenna assembly (5 & 6) into Rear Frame (4)
- Attach Hinge Assembly (3) to Rear Frame (4)
- Install 4 Rear Frame Screws (not shown)
- Install Upper Rear Cover (1)
- Install Chin Cover (2)



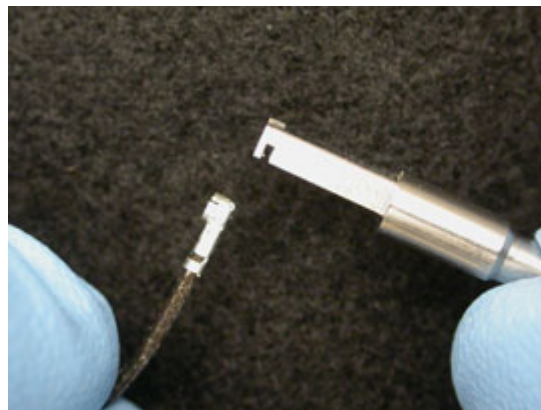
#### Upper half of phone

- Attach Front Frame (14) and Rear Frame / Hinge Assembly (15)
- Install 6 Front Cover Screws (not shown)
- Install Camera Cover (13)
- Install Front Cover (12)
- Install Label (11)
- Install Battery (10)
- Install Battery Cover (9)

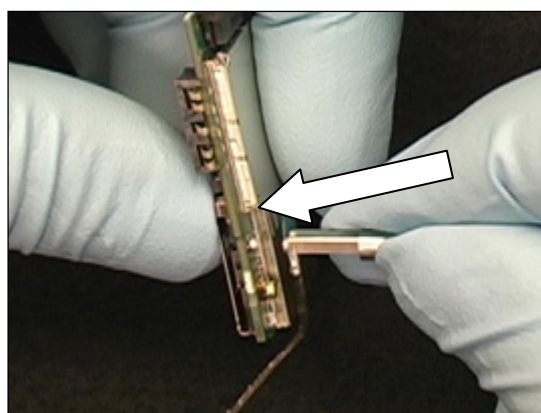


### 4.1.1 Antenna/Cable Assembly Installation to PC Board

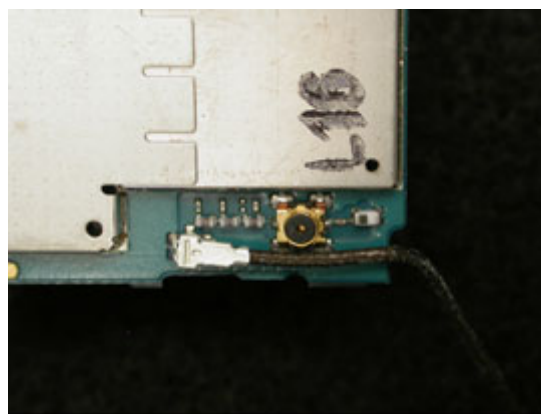
Insert the connector on the end of the antenna coaxial cable into the slot in the coax removal tool.



Using the tool, snap the connector onto the PC board.



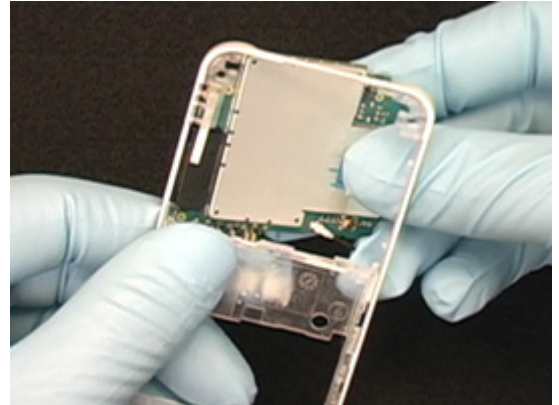
Rotate the coax cable so that it is oriented to the circuit board as shown.



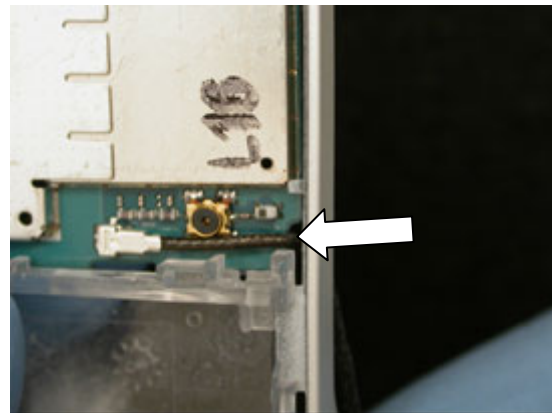
## 4.1.2 PC Board and Antenna Installation

Insert the side of the PC board with the system connector into place under the Bluetooth antenna.

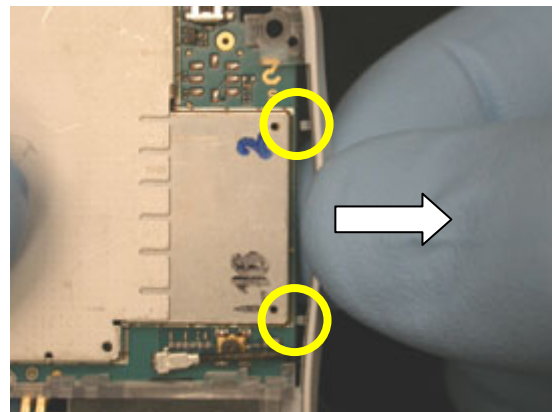
NOTE: there is a slot in the edge of the rear frame in which the system connector sits.



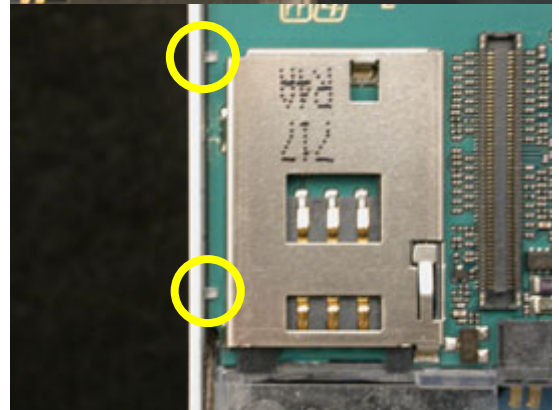
Position the coaxial cable so that it passes through the hole formed between the notch in the circuit board and the rear frame.



Work the side of the circuit board opposite the system connector into the rear frame by pulling the portion of the rear frame indicated away for the circuit board so that the two snaps clear the board's edge.



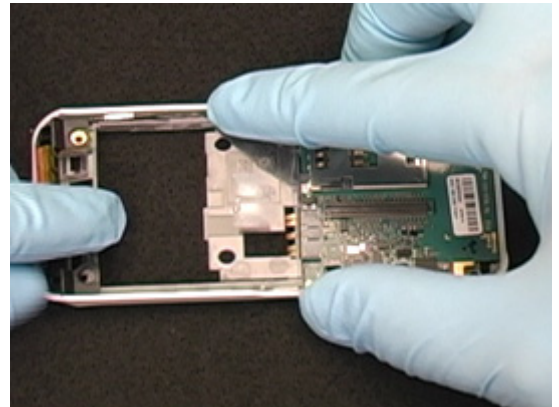
**NOTE: THE TWO SNAPS SHOULD REST AGAINST ITS SIM CONNECTOR SIDE OF THE CIRCUIT BOARD.**



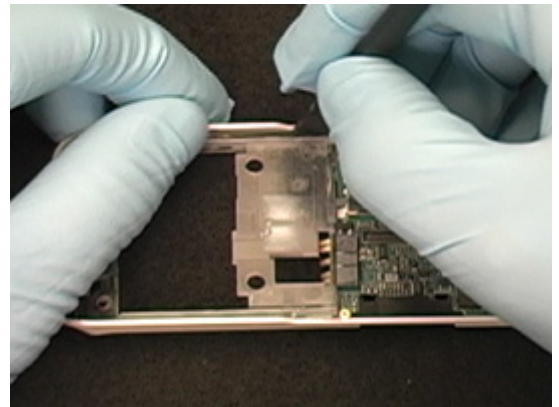




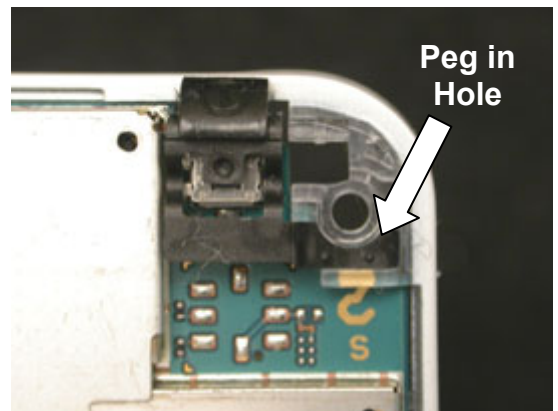
Snap the antenna assembly into its cavity.



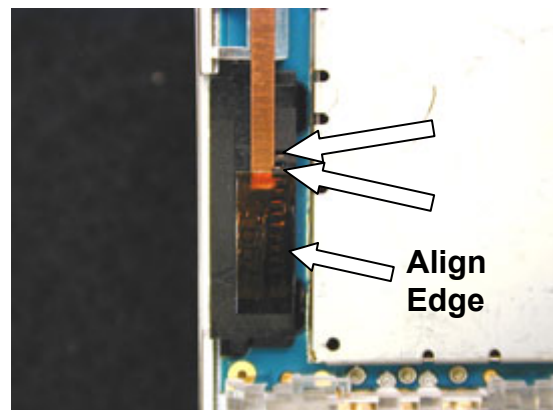
Push the coaxial cable down into the slot of the frame using a pry tool.



Insert the peg of the power key into the hole on the rear frame and press it into place



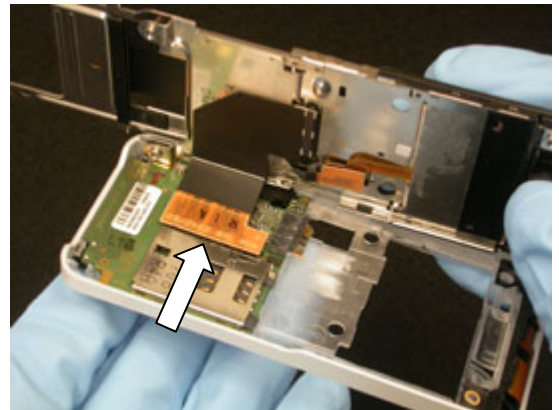
Install the Bluetooth tape using tweezers. Align the tape with the inside edge of the system connector and leave two holes exposed.



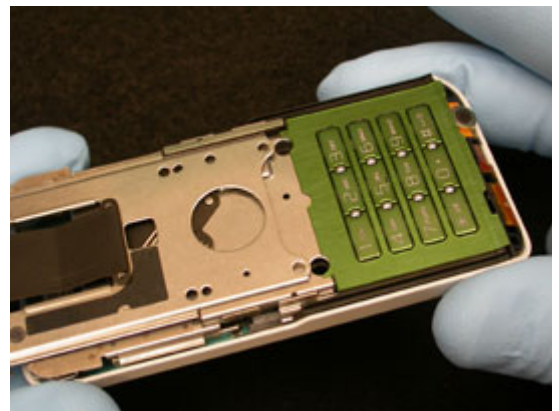


### 4.1.3 Hinge Assembly Installation to Rear Frame

Plug the hinge flex connector into the socket on the PC board.

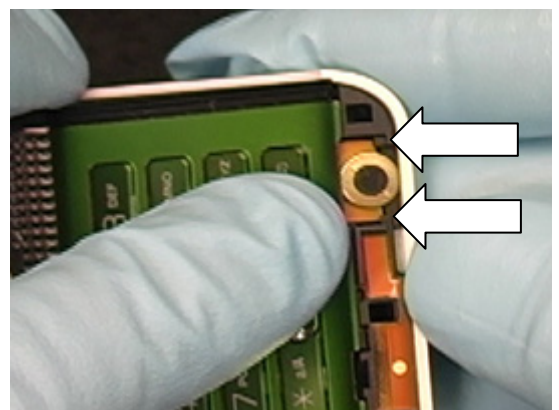


Lay the hinge assembly on top of the frame

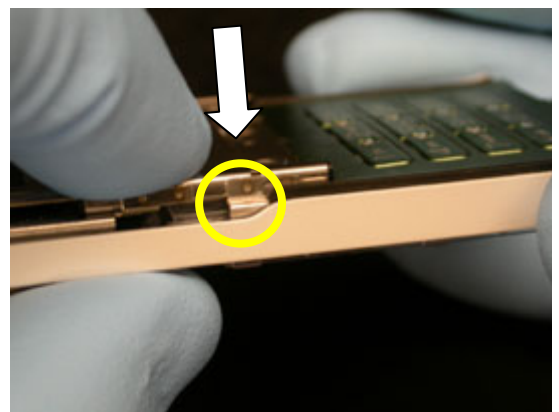


Press the end of the hinge assembly that contains the microphone into the rear frame.

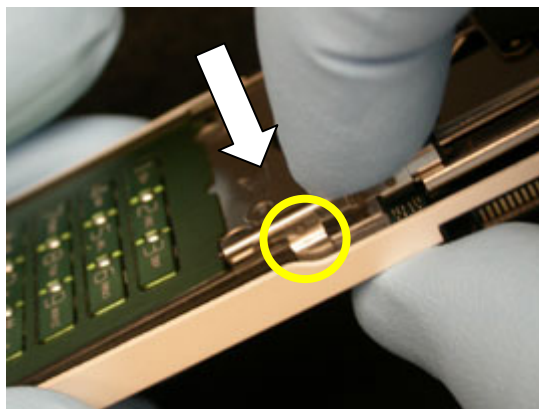
**NOTE: MAKE SURE THE MICROPHONE FLEX IS UNDER THE TABS OF THE ANTENNA PLASTIC.**



Snap the tab on one side of the frame in the slot on the hinge.



Snap the other side into place.

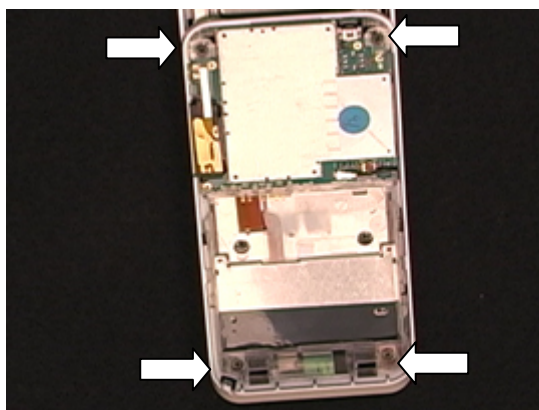


#### 4.1.4 Rear Frame Screw Installation (4 Screws)

**NOTE: DO NOT REUSE THESE SCREWS.**

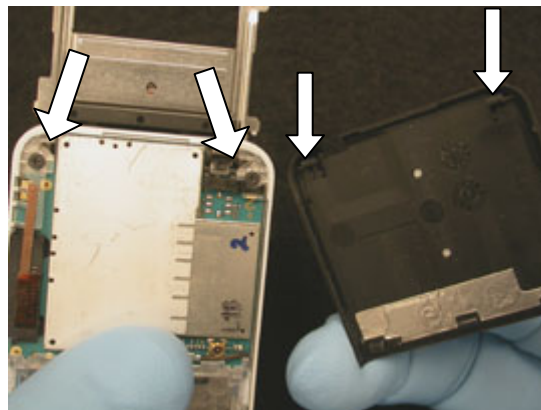
Use **10 N\*cm** and a JCIS No. 0 bit to install the four new screws.

**NOTE: THESE FOUR SCREWS HAVE BLUE THREADLOCK.**

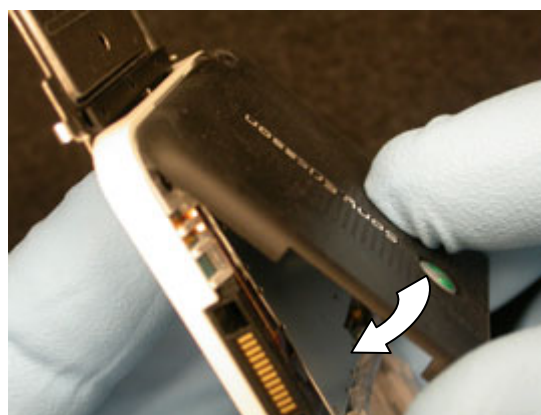


## 4.1.5 Upper Rear Cover Installation

Insert the two indicated tabs on the upper rear cover into the slots on the frame.

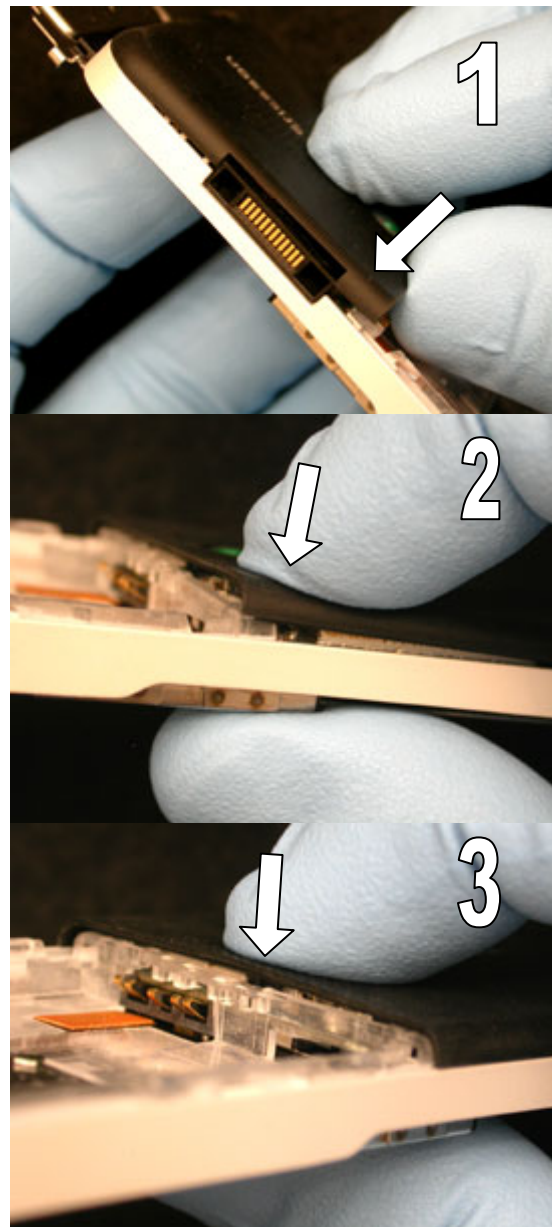


Rotate the cover down toward the phone.





Snap the remaining 3 tabs into place.  
(Shown in pictures 1, 2, and 3)



## 4.1.6 Chin Cover Installation

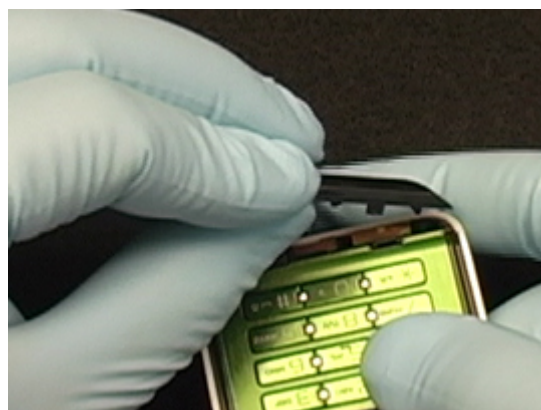
Orient the microphone gasket so that the wider side of the gasket toward the keypad.



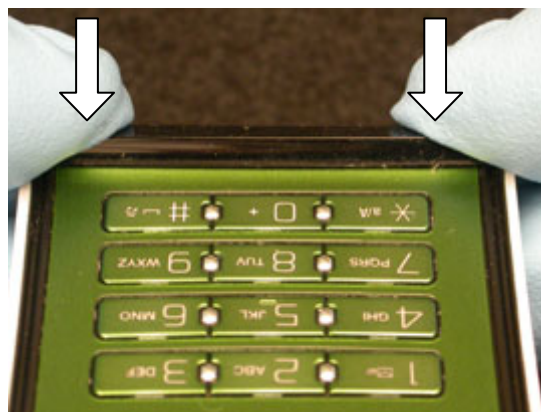
Press the gasket over the microphone as shown.



Insert the tabs of the chin cover into the slots.



Push down on the cover to snap all the tabs into place.

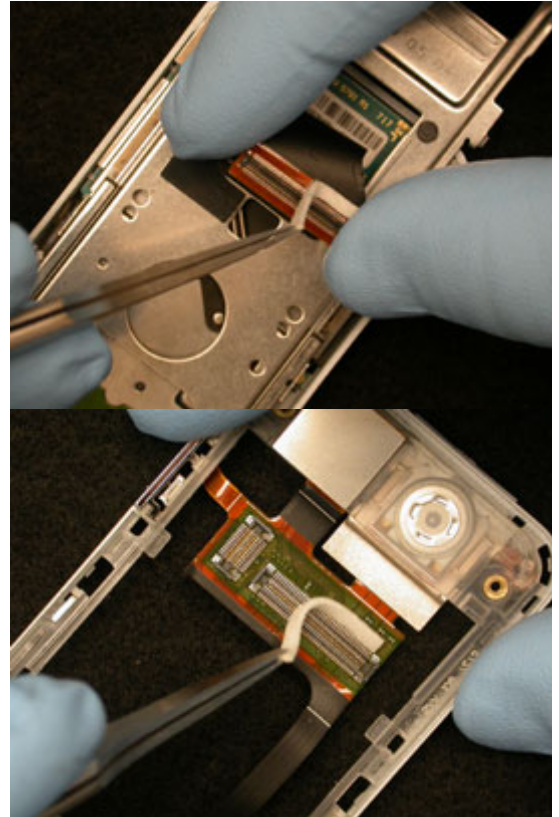


## 4.1.7 Front Frame Installation

**NOTE: ONLY BONZER FLEXES THAT HAVE NO DOTS OR PINK DOTS REQUIRE THE TWO PIECES OF CONNECTION TAPE BE ADDED.**

### **Bonzer Flex With No Dot or Pink Dot Only:**

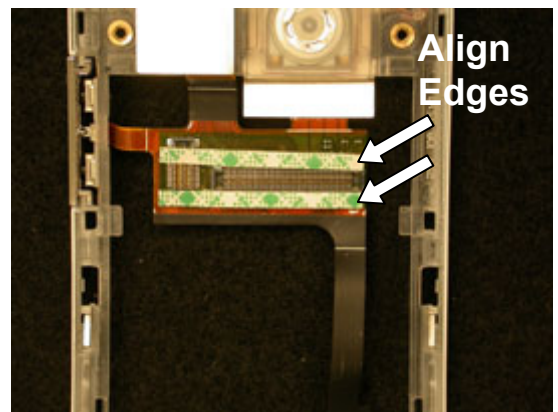
Remove any remains of the two pieces of connector tape from each half of the hinge to bonzer flex connection.



### **Bonzer Flex With No Dot or Pink Dot Only:**

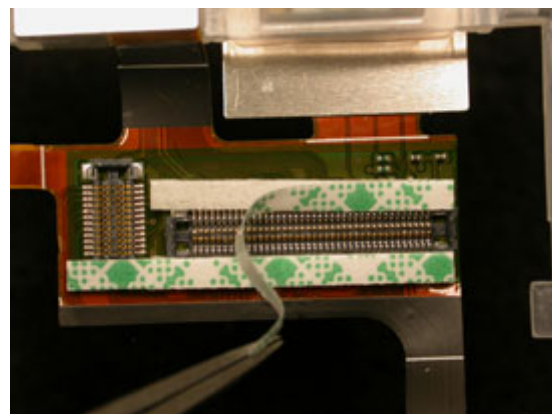
Add two new pieces of tape around the connection on the bonzer flex as shown.

**NOTE: ALIGN THE EDGE OF THE TAPE WITH THE EDGE OF THE FLEX AS INDICATED.**



### **Bonzer Flex With No Dot or Pink Dot Only:**

Remove the protective film from each piece of tape.

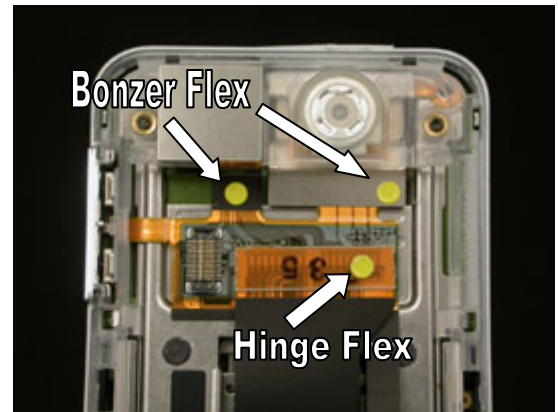




Position the front frame over the hinge assembly so that the bonzer/hinge flex connection lines up.

Use the colored dots on the flexs to verify that you have a valid bonzer flex/hinge flex combination:

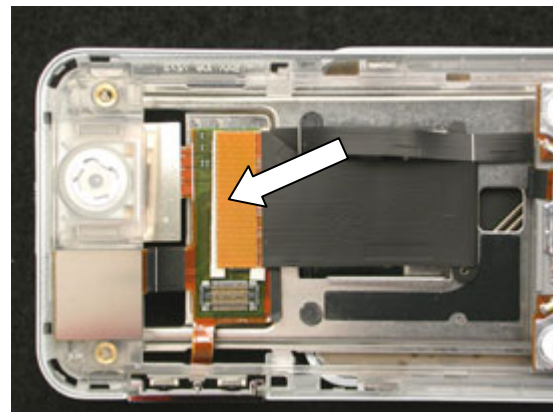
- If the **hinge flex** has no dot or a pink dot, the **bonzer flex** must have no dot or a pink dot.
- If the **hinge flex** has a white dot or a yellow dot, the **bonzer flex** must have white dot or a yellow dot.



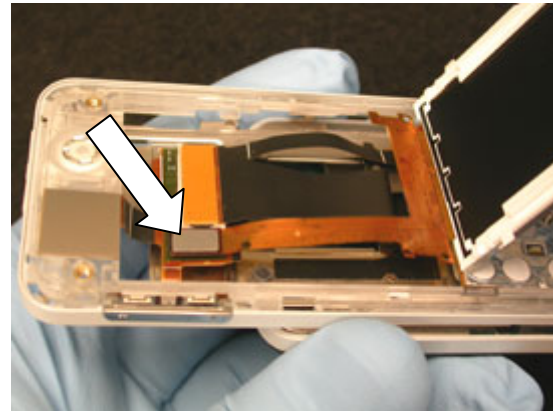
Plug the hinge flex into the corresponding bonzer flex connection.

**Bonzer Flex With No Dot or Pink Dot Only:**

Apply a small amount of pressure so that the tape bonds.



Orient the LCD as shown and plug the LCD's flex into the bonzer flex.

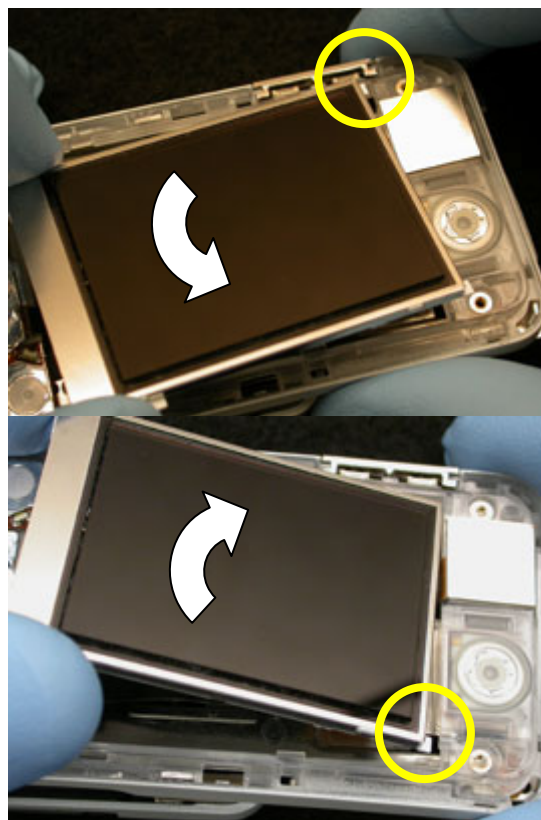


Fold the LCD so that it lays over its cavity.





Insert the upper two LCD retention features into their slots in the front frame by wiggling the LCD to the right and then the left.



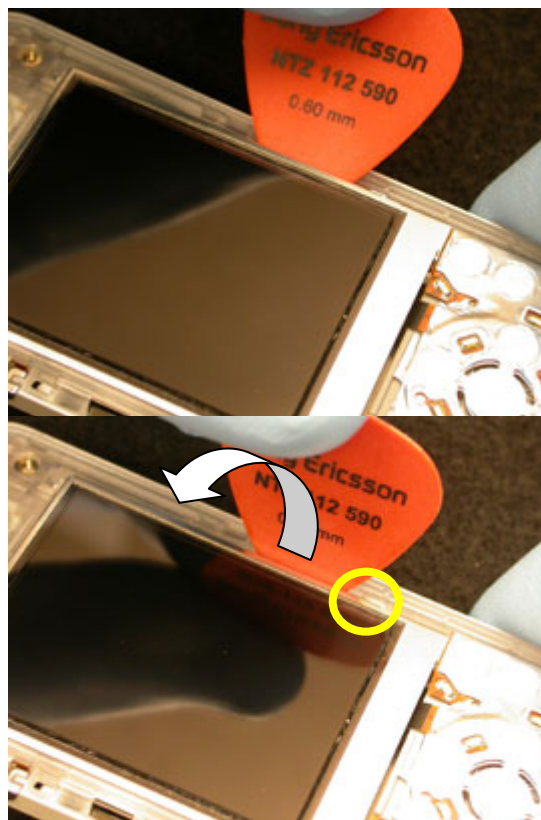
Insert the tip of the plectrum between the left side of the LCD assembly and the front frame.



Rotate the plectrum towards the LCD to insert the lower left side retention feature into its slot in the front frame.

Insert the tip of the plectrum between the right side of the LCD and the front frame.

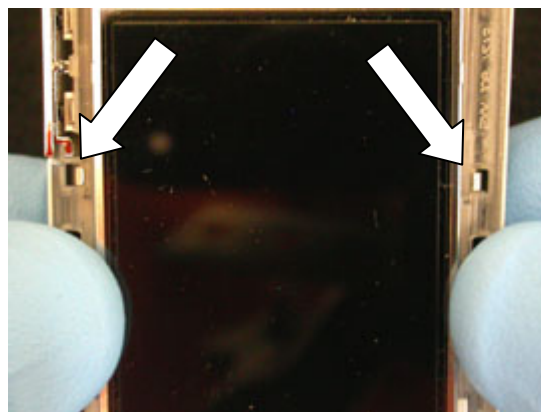
Rotate the plectrum towards the LCD to insert the lower right side retention feature into its slot in the front frame.



Holding the front frame and hinge assembly at the top, slide the phone closed.



Press in on the front frame at two side latches to get the hinge and front frame latched together.



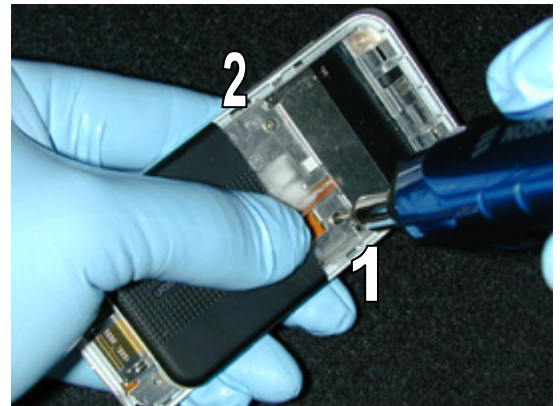
#### 4.1.8 Front Frame Screw Installation (6 Screws)

**NOTE: DO NOT REUSE THESE SCREWS.**

**NOTE: INSERT THE SCREWS IN THE ORDER SHOWN IN THE FOLLOWING TWO PHOTOS.**

Push the hinge closed a small amount until the screw holes on the front frame are visible. Use 6 N\*cm and a JCIS No. 0 bit to install the new screws.

**NOTE: THESE SCREWS HAVE RED THREADLOCK.**



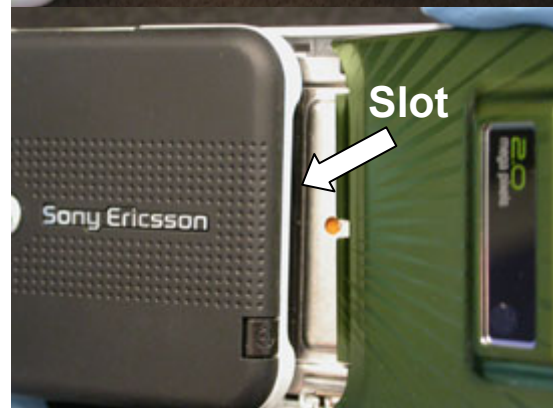
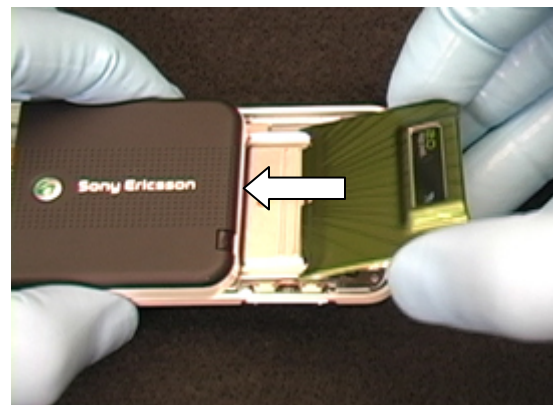
Push the hinge open and install the remaining four screws Using 6 N\*cm and a JCIS No. 0 bit.

**NOTE: THESE SCREWS HAVE RED THREADLOCK.**

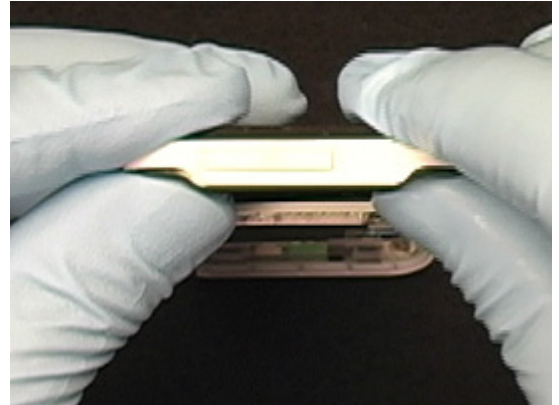
#### 4.1.9 Camera Cover Installation

**NOTE: DO NOT REUSE THE CAMERA COVER.**

Insert the bottom edge of a new cover into the slot indicated.



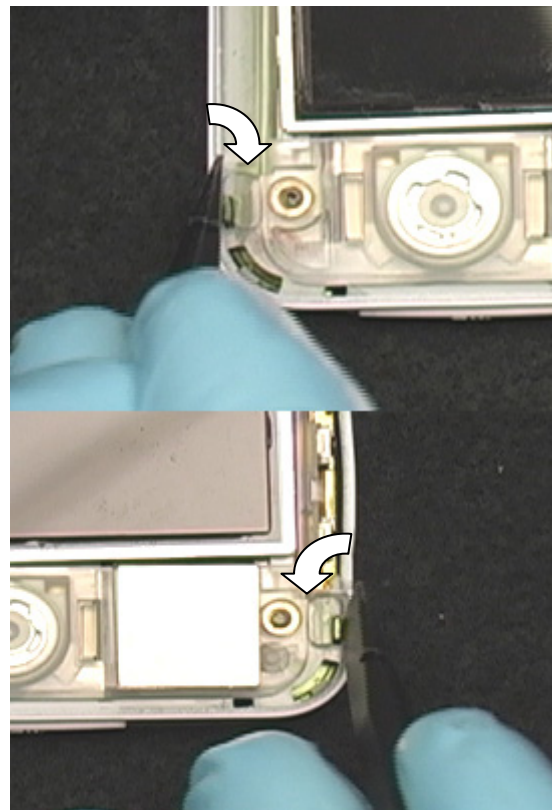
Push the cover down into the front frame so the surfaces of the cover are flush with the edges of the front frame.



Open the memory stick cover and ensure the memory stick housing correctly lines up with the opening. If it does not, remove the camera cover and reposition the memory stick housing.



While holding the camera cover in place, turn the phone over and bend the two metal tabs toward the center.





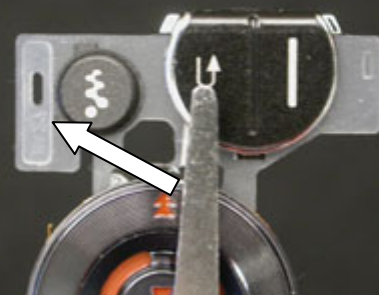
## 4.1.10 Front Cover Installation

### **W580 ONLY:**

To determine whether shims are needed, you must determine which type of navigation keypad you have:

- If it is a shimmed keypad (1), verify the front cover has no shims. Remove the shims if they are present.

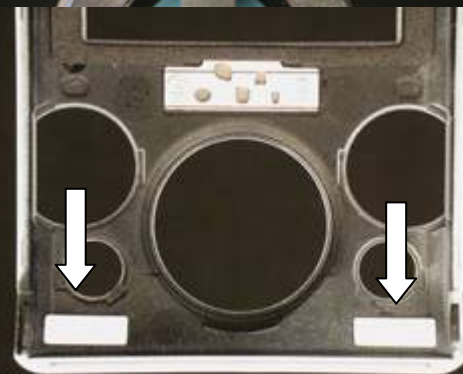
### **1 Shimmed**



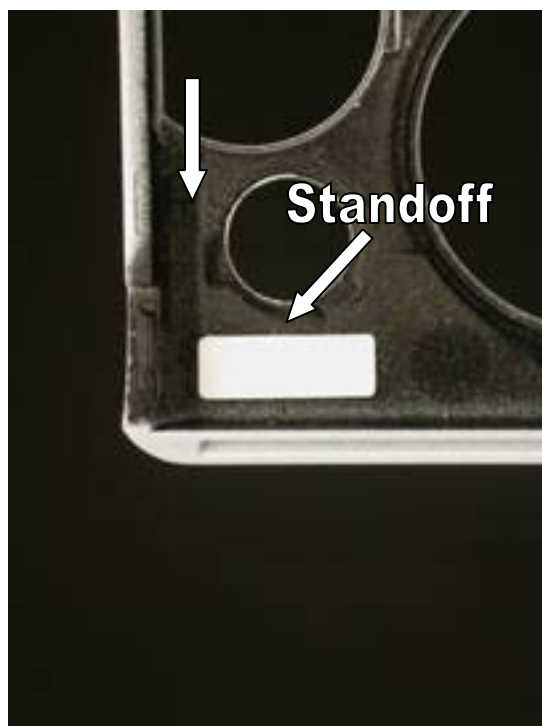
### **2 Shim-less**



- If it is a shim-less keypad (2), verify shims are placed on the front cover as shown. Install 2 large shims if they are not present as instructed below:



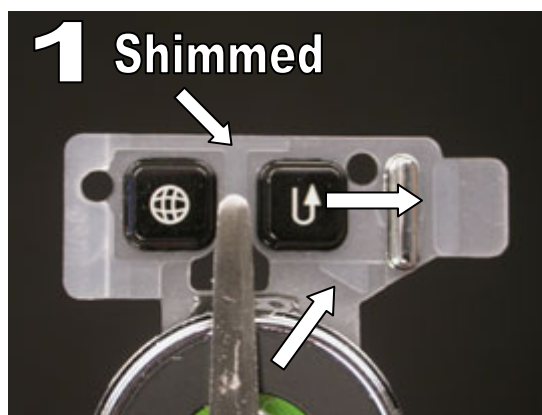
- To install the shims, line them up with the features of the front cover as indicated.



**S500 ONLY:**

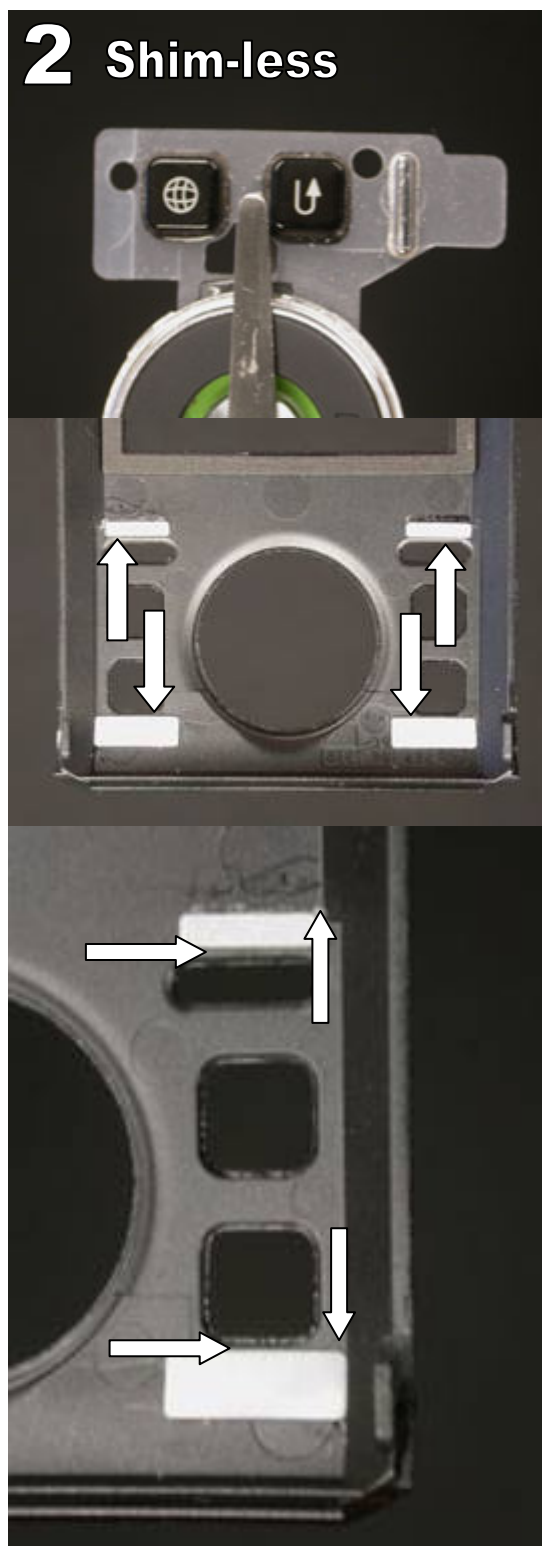
To determine whether shims are needed, you must determine which type of navigation keypad you have:

- If it is a shimmed keypad (1), verify the front cover has no shims. Remove the shims if they are present.



## 2 Shim-less

- If it is a shim-less keypad (2), verify shims are placed on the front cover as shown. Install 2 large shims and 2 small shims if they are not present as instructed below.



- To install the shims, line them up with the features of the front cover as indicated.

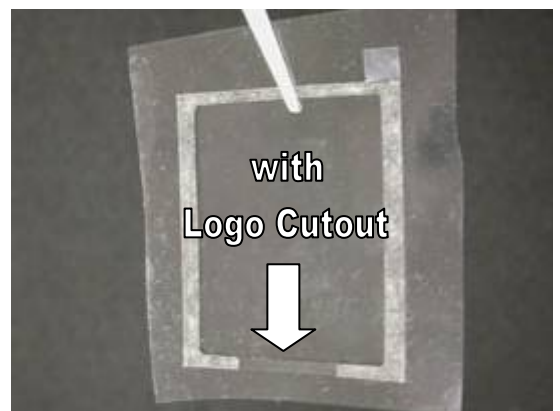


Inspect the front cover to determine if you need to add a double-sided adhesive LCD gasket:

- If the front cover is new and has a double sided adhesive gasket, proceed to removing the protective film from the LCD gasket and installing the navigation keypad step of this procedure.
- If the front cover is being reused or is new with a single sided gasket, replace the LCD gasket at instructed below.

Replacing LCD gasket:

- Insert one tip of the round tipped tweezers between the gasket and cover.
- Peel the old gasket off.
- Obtain a new double-sided LCD gasket of the correct type:
  - If you have a cover with a walkman logo, obtain an LCD gasket with the logo cutout.







- If you have any other cover, obtain an LCD gasket without the logo cutout.

- Line the tabbed corner of the gasket up with the cover features shown.

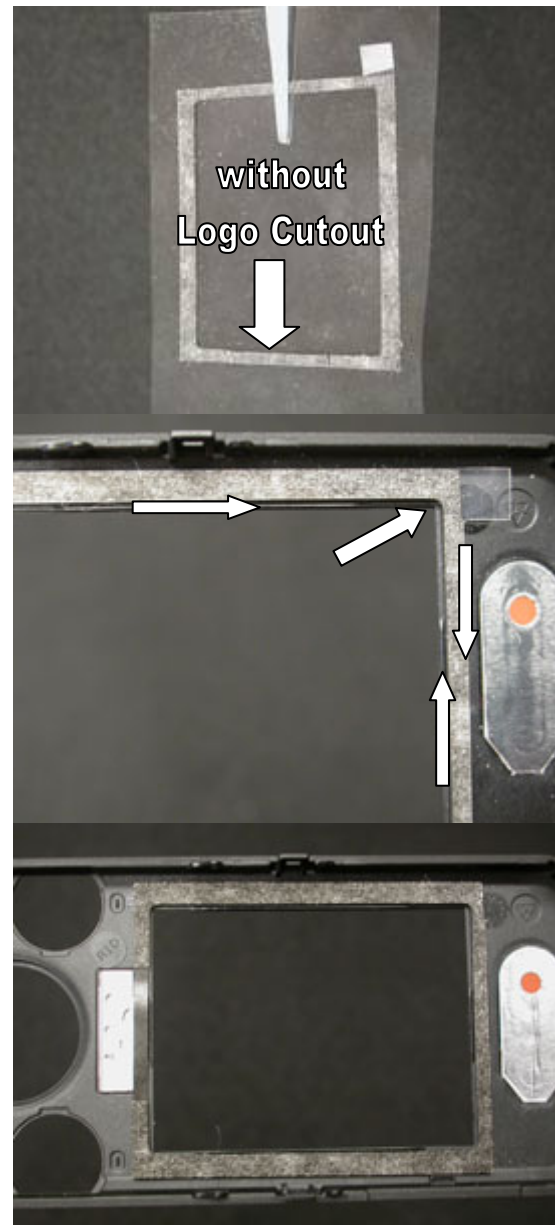
- Smooth the gasket into place around the edge of the display window.

**NOTE: ENSURE THE LCD GASKET IS NOT VISIBLE FROM THE FRONT SIDE OF THE COVER**

Inspect around the edge of the LCD for the old adhesive gasket, any adhesive residue, and damage to the LCD bezel.

If the LCD gasket or any portion of it remains adhered to the edge of the display, remove remaining gasket and clean off any residual adhesive.

If the LCD bezel is damaged, replace the LCD bezel according to the LCD bezel replacement section.



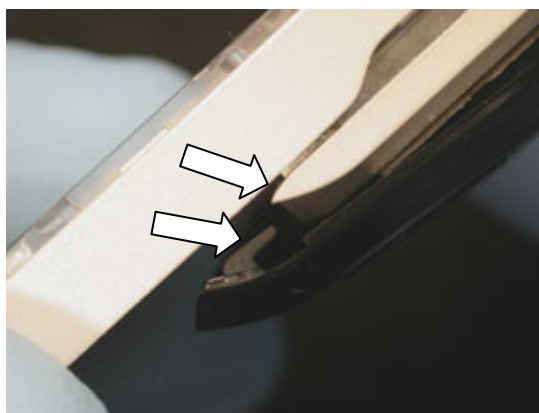
Peel the protective film off the gasket.



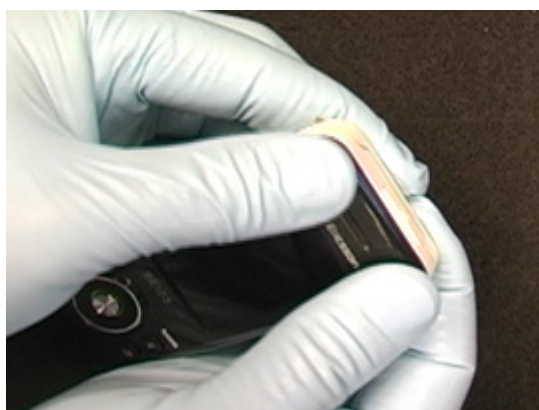
Place the navigation keypad into the front cover.



Slide the hooks at the bottom of the front cover into the slots on the frame.



Squeeze the sides and top of the phone to snap the front cover into place.



Ensure that the LCD gasket is not visible from the front of the phone.



Apply pressure on the portion of the front cover around the LCD so that a good bond forms

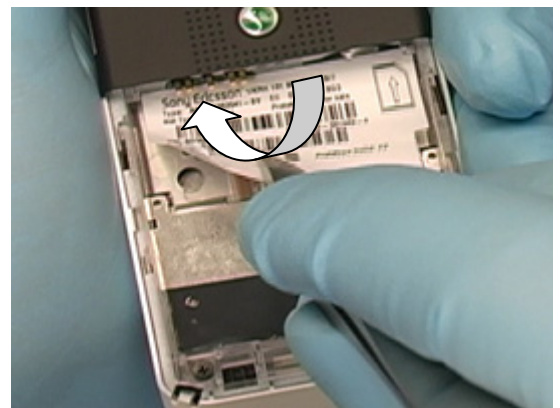


#### 4.1.11 Label Installation

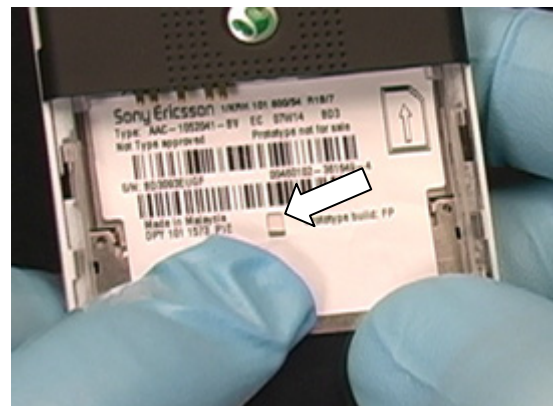
**NOTE: DO NOT REUSE THE OLD LABEL. PRINT A NEW LABEL.**

**NOTE: IF YOU ARE PRINTING A BRAZIL OR VIVO LABEL, REFER TO SECTION 5 FOR MORE INFORMATION ON THE COUNTRY OF ORIGIN.**

Insert the top side of the label under the battery connector.

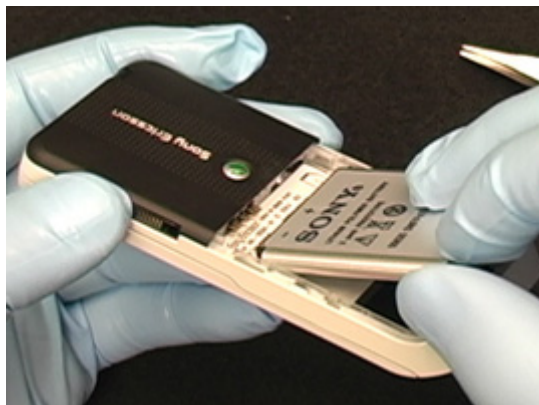


Push the label down into the battery cavity and make sure the Liquid Intrusion Indicator shows through the square hole.



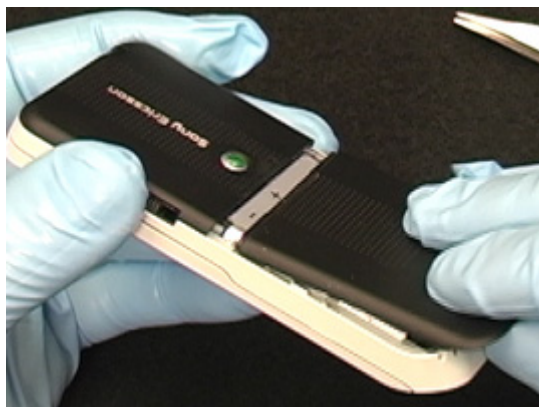
### 4.1.12 Battery Installation

Install the battery.

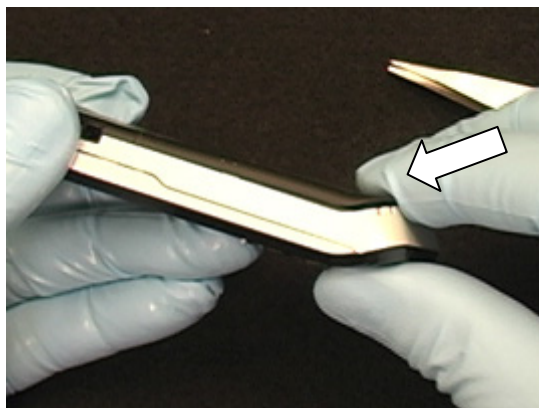


### 4.1.13 Battery Cover Installation

Insert the tabs of the battery cover into the slots on the frame.



Push the bottom edge of the battery cover downward and towards the top of the phone to get the battery cover to slide into place.







## 5 Country of Origin Barcodes for Brazil/VIVO Labels

Below is a link to a list of countries of origin. If you are printing a Brazil or VIVO label, scan the barcode corresponding to the correct country of origin for the “Fabricado” field.



## 6 Revision History

Rev.	Date	Changes / Comments
1	2007-May-30	Initial Release
2	2007-July-17	<ul style="list-style-type: none"><li>Updated disassembly and reassembly procedures to accommodate the addition of the tape between the bonzer and hinge flexes</li><li>Updated blurry pics</li></ul>
3	2007-September-5	<ul style="list-style-type: none"><li>Updated references in replacement sections</li></ul>
4	2007-October-5	<ul style="list-style-type: none"><li>Updated camera cover installation to address memory stick alignment.</li></ul>
5	2007-October-12	<ul style="list-style-type: none"><li>Updated flex compatibility, front cover shims, front cover tape, ESD shims, hinge Teflon tape covers, general opening/closing of hinge</li></ul>
6	2007-November-11	<ul style="list-style-type: none"><li>Removed ESD shims</li></ul>
7	2008-February-08	<ul style="list-style-type: none"><li>Removed Camera replacement</li><li>Removed front cover tape installation</li><li>Added do not reuse statement to camera cover removal and replacement sections</li><li>Added hinge tape replacement</li><li>Added a note regarding color of threadlock on screws in reassembly section</li><li>Updated screw torques based on mechanical assembly drawings</li></ul>
8	2008-April-25	<ul style="list-style-type: none"><li>Added shimmed keypad for W580</li><li>Added double sided LCD gasket</li></ul>
9	2008-July-02	<ul style="list-style-type: none"><li>Added brazil/vivo info</li></ul>
10	2008-08-08	<ul style="list-style-type: none"><li>Added LCD bezel replacement</li><li>Changed instructions in Hinge flex and Bonzer flex replacement sections to address the replacement of “no dot” and pink dotted parts.</li></ul>
11	2009-06-23	<ul style="list-style-type: none"><li>4.1.4 settings changed from 8 Ncm to 10 Ncm</li></ul>
12	2009-07-08	<ul style="list-style-type: none"><li>Added chapter 3.29 -3.31 regarding Board Swap</li></ul>
13	2009-09-23	<ul style="list-style-type: none"><li>ESD brush added</li></ul>